THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE.

Whole Series, Vol. XXXIX. DETROIT, MICH., OCTOBER 15, 1915. Third Series, Vol. XXXI, No. 10.

ORIGINAL COMMUNICATIONS.

ANESTHESIA IN LABOR.[1]

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The wide-spread interest in "painless childbirth" has been forced upon the profession by the exploitation of "twilight sleep" in the lay press. Lodged deeply in the heart of every woman is the instinctive hope of maternity. Hence the universal interest in the popular magazine articles on this topic. The modern woman, whose development, under prevailing social conditions, has been at the expense of her nervous system, does not endure the stress of pregnacy and labor so well as her sturdier ancestors, and this deterioration in woman's reserve nerve force shows itself especially in the increased sufferings of childbirth. In the highly sensitive, luxury bred, neurotic primipara of the present day the extreme sufferings of labor utterly demoralize the patient, inhibit effective uterine action, prolong labor, and often deal a knock-out blow to the young woman who happens to be on the border-line of neurasthenia. Add to this the stress of lactation, and a multitude of new domestic duties and sacrifices, and there is little wonder that the desire to shirk maternity is so wide-spread. Herein lies the real reason for race suicide and not simply the recollection of a painful labor, as the zealous maidens would have us believe who write the fantastic philosophies of painless childbirth with the same assurance that characterizes the old maids assembled in a mothers' congress.

Our profession has been severely criticized for not rushing blindly into any and all methods of obtaining painless childbirth, the critics wholly disregarding the fact that "safety first" wisely dominates its conservative elements. That it is desirable, from both the sentimental and physiological view-points, to safely relieve the anguish of childbirth, no one denies. The question is: Has any method been discovered that will always and without danger wholly relieve every woman from the pains of labor? A review of the various methods that have been offered will answer this question in the negative.

Sacral Anesthesia.—Injections of novocaine, adrenalin, and salt solution into the sacral canal were exploited for a time and used in various clinics with varying success, and then abandoned.

Spinal anesthesia also has never seriously been considered in obstetric practice, although it has some champions in gynecological work. The short duration of the anesthesia—from thirty minutes to three or more hours—its effect upon muscular contractions, its rather frequent failures, and its very great immediate and remote dangers, have not permitted it to find a place in obstetrics.

Nitrous Oxide Alone or in Combination with Oxygen.—The wide-spread, successful use of these agents in general surgical practice has naturally brought this method of anesthesia to the obstetrician for investigation. It is perhaps the newest suggested anesthesia in obstetrics. The theoretic dan-

[1]Read by invitation before the Germantown Branch of the Philadelphia County Medical Society, April 22, 1915.

ger to the fetus from asphyxia has not been wholly disproved. The expense and impracticability of the method in private practice offer a rather serious objection to its use. Webster and Lynch (*Journal of the American Medical Association* of March 6, 1915, pp. 812-813) both commend its use. Webster recommends a nasal inhaler with the mouth closed and uses pure nitrous oxide or a mixture with three per cent oxygen. Lynch has preferred pure nitrous oxide at the beginning of a pain, administered through a nasal inhaler, and after five or six inhalations the nose-piece is placed over the mouth, and a mixture with ten per cent oxygen is continued until the pain subsides. When the head reaches the vulva deep anesthesia is maintained, the patient's color being controlled with the usual admixture of oxygen. This method, he estimates, costs from $4 to $5 per hour. He reports 34 cases—25 primiparæ, 9 multiparæ.

34 cases received this anesthetic more than 1 hour.
32 cases received this anesthetic more than 2 hours.
12 cases received this anesthetic more than 3 hours.
4 cases received this anesthetic more than 4 hours.
1 case received this anesthetic more than 6 hours.

There were three forceps deliveries under deep oxygen-gas anesthesia.

The disadvantages of this method are the necessity for a skilled anesthetist if the danger to the infant, in long-continued cases, is to be avoided, the expense of the proper instruments and of the gases used.

Its advantages are as follows (according to Webster):

1. The apparatus is simple, easily transported, and may be used by any practitioner.

2. Deep anesthesia is not necessary.

3. There are no ill effects to mother or child.

4. The strength of uterine contractions is not diminished, no matter how long the administration of the nitrous oxide gas is continued.

5. The administration is under control all the time, and can be stopped at any moment. This is a very decided advantage which is not possessed by any method which necessitates placing a patient under the influence of drugs administered internally.

Chloroform.—Shortly after the discovery of ether and chloroform you all remember the interesting experiments that finally led Simpson to employ chloroform in obstetrics. Even in my earlier days of practice the especial safety of chloroform in obstetric practice was carefully reasoned out and explained. You now know that besides the dangers of inertia, muscular relaxation, and asphyxia which it causes, except when sparingly used, the tissue asphyxia or cell deterioration that results from even slight chloroform poisoning (liver necrosis, etc.) and the visceral changes and hemorrhagic diseases that it may cause in the fetus, have led to its abandonment in obstetric hospitals as an anesthetic or analgesic. Even its time-honored use to control the convulsions of eclampsia, which it rarely if ever accomplished, has been largely abandoned.

Ether.—This is known to be less dangerous than chloroform, but its prolonged use for deep anesthesia in obstetrics is also dangerous. It, too, will cause inertia, muscular relaxation, and asphyxia of the infant if deep anesthesia is maintained for as long a time as generally employed in surgery. Its intermittent use to produce analgesia in the latter part of the first stage and throughout the second stage of labor is efficient and the safest anesthetic we have. Administered in this intermittent way it is always under control and the ill effects rapidly pass away. The great disadvantage is the difficulty of maintaining an aseptic technique during labor if the number of assistants is not sufficient to control the semi-intoxicated patient. Moreover, the boisterous outcries of the patient who has lost her self-control, although relieved of acute pain, will often alarm the overanxious mother or husband who fails to appreciate the difference between intoxication and suffering. It is my custom to consistently use it in this intermittent manner throughout the entire second stage in both primiparæ and multiparæ, and whenever it can with safety be added to

hasten the labor, pituitrin in half-doses is used. My routine in normal cases in multiparæ is to assist dilatation manually during the first stage, give a half-dose of pituitrin when the cervix is two-thirds dilated and yielding, and begin ether analgesia at once. The danger of relaxation of the uterus is always prevented by the hypodermic use of ergot and by delayed delivery of the placenta in the third stage of labor. This plan has been so satisfactory that I can see no use whatever to even consider twilight sleep or other narcotics for multiparæ. The first stage of labor in multiparæ is almost never a very painful ordeal. Manual dilatation with the rubber-gloved fingers, kept up for twenty minutes, shortens this stage, ether analgesia can be promptly used, and the ether is given more freely as soon as the effect of pituitrin is apparent. The duration of the second stage of labor is thus reduced to minutes and pain is wholly relieved.

The real problem of anesthesia in the highly neurotic primiparæ is that of the first stage. It is not safe to use ether analgesia throughout so long a period. Repeated doses of morphine, narcophen, pantopon, or other so-called denarcotized preparations of opium cannot be repeatedly used with safety. Dämmerschlaf had its origin when we learned the dangers of too much opium to relieve the suffering of childbirth. Long ago my experience taught me the danger to mother and infant of giving more than a quarter of a grain of morphine during labor. Chloral diminishes the force of labor pains less than any drug we have. Ten grains repeated once or twice at four-hour intervals during the first stage has frequently been used with one dose of morphine, a sixth of a grain, and has materially assisted in producing quiet and sleep until the approach of the second-stage pains, when ether analgesia may be started. If there is to be a field for morphine and scopolamine, as elaborated by the Freiburg clinic, it will be in this particular class of cases, viz., highly neurotic primiparæ in the first stage of labor. Morphine and chloral have been of undoubted value. Morphine with repeated doses of scopolamine given according to the technique suggested by the Freiburg clinic—*i.e.*, absolute quiet and isolation in a hospital, the absence of family and relatives, and the moral uplift of doctor and attendants—the scopolamine repeated under careful supervision of dose and effect, will find its place in our methods. With these precautions, I believe, from my reading and limited experience, the twilight sleep will be a useful addition to our methods of relieving the pain of the first stage of labor in many selected cases. That it will not replace ether in the second stage, and will not become a routine method for an entire labor among private patients or even in hospitals, is almost assured at the present time. The last word from Freiburg has not been heard. Modification of the method continues. A few suits for damages have come to light.

One of the latest reports, that of Siegel in May, 1914, studies 220 cases. Amnesia was obtained in 88 per cent. Partial failure was noted in 23 cases, and five were uninfluenced by the treatment. In 32 cases pituitrin was used, and occasionally three doses were needed to counteract the inertia resulting from or at least accompanying the scopolamine effects. Ten per cent of the cases were operative. Marked excitement or delusion was noticed in six cases. Compared with control patients, in primiparæ the first stage was prolonged one hour and twenty-two minutes; in multiparæ, thirty-three minutes. The infant mortality due to twilight was 2.15 per cent. The average number of doses of scopolamine was six—an equivalent of 9/10 grain of morphine and ¼ grain of scopolamine; the largest number of doses to any one case was 27, representing almost 2½ grains of scopolamine.

From the above very brief résumé of the methods available you will note that none of them is ideal, and that this whole matter must depend upon the character of the case in hand. Selection from various methods of treatment is characteristic of the wisdom of our profession, and so in managing a case of labor the relief from pain

can only be secured, not by following any single method routinely, but by choosing for each case that which seems appropriate for the individual, for the stage of labor, and for the character of suffering and its effect upon the progress of labor. For example, it would be an obstetric folly to deeply narcotize over several hours the multipara whose first stage is progressing with little or no pain, and whose second stage is so rapid that often time may not be afforded to even give enough ether to wholly relieve the pain. Again, the primipara of steady nerve and little complaint will be satisfactorily carried through the first stage without suffering with a dose of morphine and one or two of chloral followed by ether analgesia. The highly nervous, emotional, or hysterical primipara can be selected for twilight sleep with entire safety, during the first stage. The advantages of the necessary environment of properly conducted Dämmerschlaf—*i.e.*, the enforced quiet and absence of sympathizing relatives, the "suggestion" elements of the technique with its moral control of the patient—all these essential accompaniments of Dämmerschlaf are most valuable adjuncts to reduce the amount of narcotic used and promote the efficiency of the amount that may be necessary in individual cases. At the approach of the second stage even this class of cases will be better and more safely managed under ether analgesia.

Finally, a waiting policy, while repeated doses and prolonged use of narcotic drugs are employed, is not only dangerous, but it is unmerciful to the nervous, obstetrically inefficient, hypoplastic individual—undeveloped by nature for the act of labor.

To permit an inefficient labor to go on for hours, under ever-increasing drug narcosis, with the added dangers of the free use of pituitrin as recently has been recommended, when instrumental or manual delivery is not only necessary but merciful, is to sacrifice obstetric art and skill to the fetish of a twentieth-century sentimentalism. The hours of effort and careful scientific investigation expended on twilight sleep have not been without their reward. Long after its notoriety has disappeared its limited and permanent place in obstetric practice will remain. That place will be its selected and restricted, but not its routine, employment.

THE TREATMENT OF THE HEART DURING AND AFTER ACUTE INFECTIONS.

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The title of this paper is so broad and general that it would be quite suitable as a title for a series of papers dealing with this important subject. The subject itself may be divided into two parts, namely, the treatment of the heart during the actual presence of acute infectious disease, and the treatment of the heart days, weeks, months, or years after an attack of an acute infectious malady. I think there can be no doubt that we are prone to institute cardiac treatment too often and too vigorously during the course of an acute infectious disease, and notably so in pneumonia and typhoid fever. In both of these conditions medical men naturally dread failure of this important vital organ and often expect the heart to do more work than nature intends it to do under the conditions which are present. We listen to the first sound of the heart, or feel the pulse, and conclude that neither is as vigorous as we would like to have it. This decision is largely due to our anxiety, but in many instances the seeming lack of power is that condition which would be present in any one who is lying at rest in bed for days at a time, and who is, to some extent, but not dangerously, depressed by the presence in his system of disease.

Not only does rest in bed quiet the circulation of every one, but there can be no doubt that not infrequently the circulation is maintained with less vigor than is ordinarily present during the course of an acute in-

fection, in order that the strength of the heart may be conserved, and this is the more important from nature's standpoint when one realizes that the disease process, causing the condition present, makes it wise to maintain as low a degree of activity as is compatible with the carrying out of other vital functions. In other words, I would like to ask the question as to whether we are not too prone to think that we know more than nature does in many of these illnesses, and whether, as a result, we are not prone to interfere with nature's processes when she knows what is best for the patient's good and when her knowledge is based, not upon the experience of an individual practitioner, but may be said to represent the inherited tendencies of innumerable generations, which in the course of various illnesses have had developed in their descendants the best methods by which infectious maladies may be met.

Every one living to-day is a striking example of the survival of the fittest, although we may have our personal opinion as to whether any particular individual is fit. He may not be individually fit, but he would not be here were it not that his ancestors possessed the power to withstand the attacks of infectious diseases which other persons, in times gone by, have failed to withstand, and have, therefore, dropped by the wayside before they have had time to reproduce their species. I think it may be fairly said, too, that most of the advances which have been made along the lines of bacteriology, immunization, and the protective processes of the body against disease, all go to show that nature is best qualified to deal with such conditions in many cases and needs only a little assistance at critical moments to carry out effects which will result in recovery.

In other words, in the treatment of cardiac conditions, arising during the course of acute illness, it may be essential from time to time to administer stimulants or supportants, but only on the rarest occasions is it necessary to administer them all the time and by so doing force the heart and nervous system to disengage an amount of energy which might well be saved for the combat in the later stages of the disease. Every one of us, I think, can recollect cases in which having once commenced to administer cardiovascular stimulants we have continued them day after day, when, if they had been skilfully administered in a few doses, they would have accomplished all that we sought; and every one who has had experience can remember cases in the practice of others, if not in his own, in which stimulants were ordered on the first day of the illness and continued with a constancy worthy of a better cause throughout its entire course.

As a matter of fact the cardiovascular stimulants that are to be used during the acute infectious diseases are very few, and probably none of them are capable of producing more than a temporary effect that is advantageous. If we consider digitalis, as the best cardiovascular stimulant that we have, we at once recognize the fact that digitalis is unable to slow the heart materially during fever, because fever prevents it from affecting the vagus nerves; and, again, when the heart muscle is suffering from the effects of the toxemia induced by the disease, it is notoriously a fact that digitalis fails to act favorably upon such a muscle, either because the toxins of the disease are stronger than it is, or because changes have taken place in the function, or organic constitution, of the heart muscle, which prevent or pervert the action of the drug. The proposition in such cases is entirely different from the use of this drug in ruptured compensation, when a large part of the cardiac failure may be due to fatigue rather than to organic change. Much as I regret to state it, I have as little confidence in the value of digitalis, when used continually in these cases, as I have confidence in its value when so employed in instances of ruptured compensation.

What I have said concerning digitalis also holds true in regard to strophanthus, and these are the only two drugs which can be looked upon as direct and lasting cardiac stimulants. Such a view, however, does not mean that I think that these drugs should never be used, but only that their limita-

tions should be recognized, and that, if used at all, they had better be given in a few large doses by means of which we can answer the question as to whether they are going to exercise an advantageous influence. If small, timid doses are used and no effects accrue, we will be undecided as to whether the lack of results is due to the size of the dose, the weakness of the drug, or the condition of the heart. If these drugs act favorably and are employed to combat temporary conditions, whereby the patient, who may be suffering from threatened or actual cardiac failure, is dragged out of his "slough of despond," and then stopped, we still have them in reserve should another calamity threaten, whereas, if they are used constantly, they are prone to lose their effect and do damage by being employed when they are not needed and so do not act when they are needed.

So, too, I think that in most instances we are prone to use strychnine too incessantly. I often tell my students that they are to regard strychnine, not as a direct cardiac stimulant, but simply as a remedy which, by stimulating the nervous system, wakes it up and so indirectly increases the circulatory and respiratory tone. This is not strictly accurate, for I believe strychnine does have a direct effect upon the heart, although to a less degree than some people think, but I feel quite confident that the use of strychnine is like the use of a whip when driving a horse: it is not to be employed all the time; it is not to be used without clear indications for its employment; and when it is used, it is to be used sufficiently vigorously for a short time to produce an effect. Two or three cracks with a whip may make a tired horse pull himself out of the mire; continued beating with the whip will put him deeper in the mire; and if used after he is mired will so exhaust him that he cannot possibly extricate himself. Not rarely the continued use of strychnine in the course of infectious disease induces nervous irritability, cardiac palpitation, and exaggerated febrile movement by the nervous irritation it causes.

I believe that strychnine cannot be used day after day in the course of the acute infectious diseases any more than one course can be steered by the captain of a ship throughout a long voyage. Often a dose, or the course, which is advisable in the morning may be distinctly inadvisable a few hours later and do infinitely more harm than good. For, after all, a patient who is ill with an acute infectious malady is still more like a ship in a storm, in that the wind, or disease, varies from time to time, both in its vigor and in the direction in which its vigor is displayed, and just as wind and wave attack her port or starboard bow at one time, her port or starboard quarter another time, and last of all strike her amidships, so do the manifestations of these acute infections now appear in the heart, again in the kidneys, again in the lungs, and in other organs. I would, therefore, strongly advocate keeping strychnine in reserve and only employ it when some sharp lapse of the circulation or nervous system seems about to occur or has occurred, and this holds true of the more rapidly acting diffusible stimulants like aromatic spirit of ammonia or Hoffmann's anodyne, which, if their influence is to be maintained, have to be given so often that the stomach rebels.

I have often seen nitroglycerin used in combination with strychnine, and have been told that it was given to combat circulatory failure. I have been trying for many years to discover where this wide-spread delusion had its origin. The nitrites at no time act as stimulants upon any part of the body, but always as relaxants or sedatives, and the use of nitroglycerin combined with strychnine, when we stop to think about it, consists in the administration of a remedy which relaxes the blood-vessels, possibly diminishes the power of the heart, and depresses the motor nervous system at the same time that the strychnine is used to produce a diametrically opposite effect upon all these parts. In cases in which we know that the patient had a high arterial tension prior to his illness, and the tension is materially increased by his fever, it may be wise to use the nitrites to reduce

the excessive blood-pressure and diminish the labor of the heart, but, surely, they ought not to be employed if the blood-pressure is within normal bounds, for, as I have already said, physicians universally have no dread of a moderately high blood-pressure, but have great dread of even a moderately low one. If a large part of the high blood-pressure is due to arteriocapillary fibrosis it is inconceivable that nitroglycerin can do it good, since it cannot relax fibrous tissues but only can relax the circular muscle fibers of the blood-vessels which are in spasm. He who discovers a drug which can soften and relax fibroid vessels will have at least approached the Eldorado of Eternal Youth, and there is no use in our deluding ourselves therapeutically when our good sense, based upon morbid anatomy and pathology, proves that our therapeutic attempts are futile.

Some of those who have heard me so far have possibly come to the conclusion that I am a therapeutic nihilist or pessimist. Nothing is further from the truth. My plea is: use drugs boldly when needed, stop them when they are not needed, and, still more, do not give them in the first place when they are not needed. To avoid constant medication, to recognize that the marvelous protective processes of the body are, in most instances, better qualified to help the patient than we are, and to further recognize that the remedies, which are prescribed with good intent, may be advantageous along the line that we perceive, but possibly disadvantageous in their effect upon protective processes which we cannot perceive, is important. Up to the present time we have almost no knowledge of the effect of drugs upon bacteriolysis, agglutination, phagocytosis, and the development of antitoxins. Under these circumstances we must be careful not to lay ourselves open to the charge of the cynical Voltaire, who said "physicians were persons who poured drugs of which they knew little, into bodies of which they knew less." "Let us," therefore, as I say on the opening page of my book upon "Therapeutics," "be watchmen all the time and therapeutists only when the necessity arises," and let us never be classified as druggers.

Before I leave this subject of the employment of stimulants in acute diseases, I may say a word in regard to the use of alcohol. It is impossible to consider this great subject in any one paper. Suffice it to state that physicians for generations have considered that the use of alcohol, certainly in exhausting diseases, characterized by great depression, was distinctly advantageous. There is also no question but that every scientific investigator of importance has shown beyond doubt that alcohol is never a stimulant, as we commonly employ that term, but rather always a depressant—that is, as this term is applied in contradistinction to stimulation. This seeming wide divergence between clinical experience and laboratory research depends largely upon the fact that the records of the scientific investigators were obtained from healthy men, and the records of the bedside physician from diseased men, and nearly all drugs act differently in these two types of mankind. We know that alcohol is not a stimulant, as we commonly use that term. We also know beyond all doubt from scientific investigation, as well as from clinical experience, that this drug is readily burnt up in the body and provides it with energy, an energy which it does not need in health, but which it often needs in disease, and that, being so burnt up, it protects the proteids and fats, maintains the patient's nutrition, and prevents wasting, provided, of course, that it is given in the proper dose at the proper time. Whether the very large doses which have often been employed in the past are necessary is to be determined by each individual for his patient. It may have been used in excess, but, like blood-letting, this is no reason why alcohol should be utterly cast aside.

There is little time for me to discuss the treatment of the heart when it is suffering from the more remote results of the acute infectious diseases. In many instances degenerative changes, induced by the infection, are so severe that we have no more right to expect a remedy to do good than we

have a right to think of a substance which can make a rotten tree sound. Beyond doubt the most important cardiac remedy in all these cases is rest, and the more absolute this rest the better. After the heart by rest has gained a little reserve power, gentle massage and Swedish movements, gradually increased in vigor to aid in the circulation of the blood and lymph, are most advantageous, provided they are never employed to such an extent that the patient feels tired and exhausted when the treatment is over. Too often both the masseur and the patient think that "the money's worth" of the treatment is not given unless it be as vigorous as that applied to a prize-fighter in training.

Concerning the use of digitalis and strophanthus, our hope is that many of the patient's cardiac symptoms are due to the fatigue of a weak heart rather than to the weakness of a degenerated heart, and in these cases the skilful administration of digitalis, strophanthus, and iron and arsenic is most advantageous. I think, too, that we get more value from the use of moderate doses of old-fashioned Donovan's solution in these cases than we give this combination credit for. The whole point in these cases is to determine the limitation of the patient's strength, with particular reference to his heart. Often it is best to use a few large doses of digitalis or strophanthus, until we have established definite cardiac effects, and then to reduce the dose and, by so doing, maintain the effect, rather than to produce an excessive result. In cases in which the patients admit, or possibly deny, venereal infection, the use of drugs designed to combat this primary cause of disease is always advantageous, and I think that we often neglect to inquire into the early venereal history of many cardiac diseases, because the immediate cause of the illness, such as rheumatism, influenza, or one of the other acute infections, looms so large in the near past.

Another point which must be carefully considered in the treatment of myocardial degeneration, or of ruptured compensation due to valvular disease, is the question as to what is the normal blood-pressure for this individual patient. We are too much inclined to consider that all patients must have a blood-pressure approximately 130 systolic and 80 diastolic, and we fail to recognize that there are certain individuals in perfect health, so far as we can determine, who maintain a blood-pressure either higher or lower than the standard. For this reason it is often of great importance to discover, if possible from previous records, what the patient's blood-pressure was when he was well. Furthermore, we must remember that a rising blood-pressure is, in one sense, nature's method of meeting a condition, which, if not met, will produce disaster. As fibrosis of the smaller vessels occurs with advancing years, or because of an old specific infection, the blood-pressure must be raised if the tissues are to receive the quantity of blood which is necessary for their existence. While it is theoretically true in all and practically true in many cases, that by reducing the blood-pressure we diminish the labor of the heart and so protect this organ, we have to determine in every case whether it is better to lower pressure, and so diminish peripheral circulation, or whether it is better to raise pressure to increase the peripheral circulation, even if such a rise carries it above the theoretical normal level and throws an increased burden on the heart. In other words, in the latter type of case it is our duty to support the heart by rest on the one hand, and the active administration of digitalis on the other. We may regret that this organ has to meet such large demands, but we have to make the best of a condition which we cannot avoid. In no type of case is more skill required, on the part of the physician, than in that type in which the heart is not doing as well as it might, and in which the question arises as to whether the pressure can be lowered with advantage, or whether everything should be done to prevent it from being lowered by the cardiac fatigue, which is inevitable if we do not give support to the heart.

AFFECTIONS OF JOINTS SIMULATING RHEUMATISM.[1]

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The further one progresses in the study and knowledge of joint conditions, the more he is impressed with the frequency with which he encounters both error and difficulty in their diagnosis. The old standard —which might be recorded somewhat as follows: it involves a joint; it looks like rheumatism and acts like rheumatism; it is in the joint, therefore it is rheumatism— does not now obtain. The specialist finds himself being led far afield from what is and has been recognized as rheumatism, and where he goes the general practitioner will eventually follow. As it was with malaria, so it will be with rheumatism, and the time is not far distant when the diagnosis of rheumatism will be made either from a typical clinical picture with accurately defined symptoms or from a laboratory report of certain bacteriological, biochemical, or pathologic findings. Naturally the subject divides itself into two great groups, the acute or the chronic, and in both of these we find rheumatism represented.

The classical picture of acute rheumatism still holds in the realm of diagnosis. I believe we have acute conditions due to poisons from within the system from either alterations in the chemical processes of metabolism or from disturbance in the elimination processes or functions, and these should be considered the cause of rheumatism until we are able to show that some specific germ infection is capable of causing such changes and is in reality the prime cause. I believe also with the great majority of orthopedists that in the near future the term rheumatism will be dropped from the list of diseases and that all cases will be classified under other and more accurate titles. However, we are not yet ready to take this step, and for the present must confine our consideration of these conditions to the elimination or exclusion of every other disease before making the diagnosis of rheumatism.

[1]Read at South Branch of the Philadelphia County Medical Society, April 30, 1915.

Of the acute conditions which simulate rheumatism, acute septic arthritis has many symptoms in common, but differs in that while it may affect several joints primarily, it finally becomes located in one joint and there develops a more or less violent inflammation of the synovial membrane and the periarticular structure. This condition is more common in young children, while rheumatism is extremely uncommon, the most frequent age of involvement of rheumatism being between fifteen and twenty-five years. The pain is severe and is uninfluenced by salicylates or other antirheumatic remedies. The severity of the disease continues localized much longer than in the rheumatic case, and the process may terminate in ankylosis from the fibrous exudate or in suppuration. There is a typical septic temperature; leucocytosis of varying degree is present; chills may occur; the joint is acutely inflamed; the heart is very infrequently involved; and there are no acid sweats so characteristic of the acute rheumatic involvement. There is also no remission of the symptoms until recovery begins, or, if suppuration ensues, until the pus is evacuated. The onset is acute and the progress is rapid, but the damage to the joint is usually serious, though if only stiffness results, this can usually be entirely overcome by appropriate treatment.

So-called "gonorrheal rheumatism" may prove confusing if there is no suspicion of an attack of the infection. Here, however, there are again the fleeting pains in various joints with ultimate localization in one or two parts resulting in a violent inflammation. It is not uncommon to find involvement of the temporomaxillary, sternoclavicular, sacroiliac, and acromioclavicular joints in this form of infection, though the inflammation does not linger or prove so severe as in the knee, ankle, elbow, or wrist. The pain, in this condition, is the most severe in type of any form of infection and is but little influenced by internal

remedies. In fact, when a case with such manifestations presents itself, the clinician should always be suspicious of gonorrhea. Care, however, should be had to verify the infection by examining the discharge and *finding the gonococcus,* as serious consequences might result from such a false or unconfirmed diagnosis in an innocent patient. The history of an attack of gonorrhea, however, followed by joint involvement during the height of the discharge or during recrudescence or after apparent recovery, and the involvement of one or two joints in a most violent and most painful inflammation, should warrant the diagnosis of gonorrheal infection of the joint. The part may undergo gradual resolution with partial recovery of function, complete and permanent ankylosis, or suppuration and destruction of the joint. Chills are uncommon; acid sweats do not occur; there are no remissions of the inflammation, and analogous joints are not involved.

It is unnecessary to do more than mention those cases of traumatic joints which follow immediately on the receipt of the injury and in which after recovery the effects of the injury continue and changes of the weather cause pain and discomfort. This occurs with all similar conditions, such as fractures, dislocations, etc., and is not significant of rheumatic involvement, although custom constantly refers to this type of pain as "rheumatic pain."

Of the chronic joints, the most important for differentiation from rheumatism is the tubercular. It is likewise the easiest, and failure to recognize it almost always depends upon neglect to properly examine the part. It is slow in onset, chronic in progress, monarticular in form, and presents: (1) interference with function gradually progressive; (2) muscle rigidity more or less completely fixing the joint; (3) localized tenderness over the foci of infection in contradistinction to generalized tenderness in rheumatic joints; (4) slight pain, at times referred and always coming later in the disease; (5) gradual swelling from proliferation of granulation cells; (6) slight elevation of temperature; (7) formation of an abscess and later sinuses; and (8) profound atrophy of all structures concerned with the joint. The age of the patient is likewise important, as it occurs most frequently between the third and twelfth years of life and is usually of a destructive character. As before said, the most common cause of error in such a diagnosis is neglect to properly examine. The clinical picture is so very different that when it is developed fully there is no possibility of error. Of course, the Roentgen ray is of value as showing the extent and the character of involvement in the part and should be utilized wherever possible to confirm the clinical findings.

In close relation to the tubercular joints is the syphilitic infection, though one finds the latter more frequently among adults. In this there are usually other signs of syphilis, such as involvement of other parts, glandular enlargements, involvement of the liver, etc. The pain is usually worse at night and is boring in character. Locally there is periosteal thickening, and the shaft of a bone is more likely to be affected than in other conditions. The progress is slow and chronic, and the Wassermann or Noguchi tests are mostly positive. Marked changes in the shapes of long bones may be noted as well as local areas of breaking down. A history of syphilis or evidence of lues in other parts of the body will usually put the physician on guard and prevent a hasty conclusion in favor of the much-abused rheumatism.

We now come to that large group of cases and conditions which, because of the obscurity of the lesions, and the difficulties surrounding their investigation, cause more confusion to the general practitioner than any other. We refer to those cases of chronic septic arthritis of the many varying types which may attack any age and any joint. We shall not attempt the differential classification of these conditions from the standpoint of their pathology, as this cannot conveniently be studied by the general practitioner. From the character of their etiology, however, they become of much greater importance and possess the greatest possible interest to the physician as present-

ing something tangible for treatment. The hypertrophic, atrophic, and other divisional forms are not yet understood so far as concerns cause and treatment, but where there is present a polyarticular affection with a history of a long-standing tonsillar infection or a marked pyorrhea alveolaris, the physician may be able to prove a causal relationship between the two by curing the tonsil or mouth infection and noting subsidence of the joint symptoms. His rule of practice should be to suspect a focus of infection in all cases of chronic joint involvement whether single or multiple, and then to search for it. The joint itself presents a history similar to that of rheumatism so far as recurrence of the attacks is concerned, but the resulting deformity to the joint and the periarticular structures is very much greater than that observed in chronic rheumatism. The swelling, deformity, pain, and limitation of function, together with the gradually progressive involvement until function is entirely lost and the joint is destroyed, is a typical picture of the toxic or septic form of joints, which is not seen in rheumatism.

The so-called rheumatoid arthritis, arthritis deformans, osteoarthritis, and the multitude of synonyms by which the condition is known, are but the arthritic expression of a disease in some other part of the body. The only symptoms present in the vast majority of cases are those of the joints and of the local infection. There is no heart involvement, no pronounced anemia, no marked aciduria, no marked disturbance of the general health or of the general functions—in fact, nothing in common with rheumatism excepting the joint involvement, and a diagnosis cannot properly be made from one symptom. Salicylates and other antirheumatics do not influence their progress, and in many cases the treatment is unavailing because of inability to attack the cause.

Every patient presenting a single or multiple joint deforming condition must be most carefully examined for lesions in the nose and throat or accessory sinuses, the ears, teeth or mouth, lungs, bronchial and mesenteric glands, gastrointestinal tract, prostate gland or pelvic organs, gallbladder, appendix, and any of the common locations of chronic septic processes, and when one is found it must be eliminated by appropriate treatment. If the involvement is in the lower extremities, the feet and shoes must be carefully examined, as the disturbance of the balance in the sensitive structures of the knee and hip-joints by reason of improper methods of standing and walking may prove disastrous to these parts and cause marked changes in structure. One must make use of every means at his command to ferret out the cause in these cases instead of quieting the patient with the diagnosis of rheumatism. It is all-sufficient to the patient, but not to the physician who earnestly wishes to help or cure his cases.

In a paper such as this one more condition should be mentioned because of the very great frequency with which it is wrongly diagnosed. This is weak or flat feet. There are two periods when they prove especially painful: first, in the stage of acute breaking down, when they become swollen, tender, and painful; and in the later stage when they have become everted and rigid. They differ from a rheumatic affection in that there is no fever, no involvement of other parts, and when the swelling subsides no thickening of the joint structures or changes as in rheumatism. Furthermore a careful study of the feet will show them everted, and the history of the case will be found one of strain from long standing or improper and ill-fitting shoes. A few days rest off the feet will relieve the pain, tenderness, and swelling, and properly fitted shoes and exercises to strengthen the weak muscles will accomplish a cure.

DIAGNOSTIC THESES IN PULMONARY TUBERCULOSIS.

BROWN in the *Journal of the American Medical Association* of June 12, 1915, gives these diagnostic points, which have direct bearing on questions of treatment:

1. An appearance of ruddy health does not exclude tuberculosis.

2. In any patient with constitutional symptoms, no matter of what he complains,

the possibility of tuberculosis must be kept constantly in mind.

3. Prolonged and intimate exposure at any time of life, but especially in childhood, and in home or workshop or office, is vastly more important in diagnosis than "unassociated" or "non-contact" heredity.

4. Prolonged contact with tuberculosis may lead to infection, but debilitating conditions are necessary usually to cause this to develop into clinical tuberculosis.

5. Constitutional or general symptoms lead us to a diagnosis of tuberculosis, while the localizing symptoms point out the organs involved.

6. The history or presence of certain complications, as fistula in ano, pleurisy, dry or especially with effusion, adenitis, a discharging ear, coming on painlessly, are all strongly suggestive of tuberculosis.

7. Loss of color, prolonged exposure to tuberculous infection, especially in childhood, with a history of swollen glands at that time, the more recent subjection to debilitating conditions, the presence of unequivocal constitutional and localizing symptoms, with or without the aforementioned complications, demand a diagnosis of pulmonary tuberculosis even though no abnormal physical signs are present in the lungs.

8. Your patients, your friends, your family, are as prone to contract and develop pulmonary tuberculosis as hundreds of others.

9. The importance of physical examination in the diagnosis of pulmonary tuberculosis has been overemphasized.

10. Symptoms are a better and more accurate guide to activity than physical signs.

11. Symptoms without physical signs demand treatment, while physical signs without symptoms require only careful watching.

12. Slight but persistent rise in temperature and increase in rapidity of pulse are often present early in the disease.

13. The usual weight of a patient who develops pulmonary tuberculosis is often 10 pounds below the normal weight for his height and age.

14. Failure to interpret rightly the significance of symptoms, to detect the presence of abnormal physical signs, can be condoned; but failure to ask for and examine the sputum repeatedly in any patient with chronic cough is inexcusable.

15. Absence of tubercle bacilli in the sputum means only that bronchial ulceration has not occurred.

16. Auscultation and inspection are the most important procedures in the detection of abnormal physical signs.

17. Inspection reveals localized retraction of the chest wall and limitations of the chest movement.

18. Auscultation is more important than inspection, and the detection of râles by the auscultation of the inspiration following cough is the most important procedure in the detection of physical signs of early pulmonary tuberculosis.

19. Changes in the relative lengths and intensity of the inspiration and expiration are valuable but less easy to detect.

20. The disease is practically always more extensive than the physical signs indicate.

21. Abnormal physical signs in one apex should be considered as due to pulmonary tuberculosis until proved not to be, while those at the base should be looked on as non-tuberculous until definitely proved so.

22. The fluoroscope, the roentgenogram, and stereoscopic plates may reveal and locate pathologic pulmonary changes to be detected by no other means.

23. When sputum is lacking, or when tubercle bacilli are absent on repeated examinations, the possibility of the presence of bronchiectasis, hyperthyroidism, syphilis, and influenza, and more rarely pulmonary tumor and Hodgkin's disease, should be borne in mind.

24. No modification of the tuberculin tests as yet devised differentiates clearly clinical tuberculosis that demands vigorous treatment from non-clinical tuberculosis that requires only a God-fearing life.

25. It may be impossible to determine definitely the presence or absence of clinical tuberculosis.

EDITORIAL.

ACCIDENTS UNDER NITROUS OXIDE GAS.

It has generally been considered that the mortality under nitrous oxide anesthesia is about one in one hundred thousand cases, and for this reason it is universally recognized that this is the safest type of anesthesia which can be induced. Occasionally a practitioner is so unfortunate as to have a patient suffer from a grave accident during its administration, the results of which may be fatal. The very rarity of such accidents makes it important to study them carefully when they occur.

In the *New York Medical Journal* of January 30, 1915, Luke, who is anesthetist to St. Luke's Hospital, New York, recorded two cases of accident, one fatal, under nitrous oxide-oxygen inhalation. One patient was a male of seventy-one, who was suffering from arteriosclerosis and gangrene of the right foot. He was a rather pale old man, but well developed and well nourished, and did not present an aspect of one who was gravely ill. There was no dypsnea, cyanosis, or edema. The pulses were equal, regular in force and rhythm; the heart seemingly normal in size and position; the sounds distinct and of good tone. There was a diffuse systolic murmur at the base, probably not organic. The lungs were negative. The blood-pressure three days before operation was 125 systolic; 80 diastolic. The gas was administered in order that the right foot might be amputated. The anesthetist had a fairly large experience with gas-ether sequence, but only a very limited experience with nitrous oxide-oxygen. On leaving his room the patient's pulse was 84 and respiration 24. The patient was started on a bag of pure gas with a small supply of oxygen introduced after the first two or three breaths. Moderate cyanosis developed in about a minute, which speedily became more intense, and this was accompanied by somewhat labored breathing. More oxygen was then given. The skin incision was made, and a moment later a large amount of oxygen was turned into the bag and the gas turned off because the cyanosis was increasing and the breathing was becoming very labored. After a few convulsive efforts the respiration ceased; the pupils dilated. The face mask was immediately removed and every method of resuscitation resorted to, including the pulmotor. The patient was pronounced dead six minutes after entering the operating-room. As far as could be determined the heart stopped with the respiration.

This case, it would seem, only goes to prove that all patients of advanced years with degenerative changes in the cardiovascular system are bad anesthetic risks. No autopsy was permitted, therefore the exact cause of death in this instance could not be determined; but a point of considerable importance would seem to be that any considerable degree of cyanosis developing in an old person is a danger-signal.

Dr. Luke evidently thinks the case just described a death from asphyxia, as he so heads it, in distinction from his second case, which he calls syncope. The syncope occurred in a fairly vigorous young woman of thirty-three, who was subjected to a radical operation for carcinoma of the breast. In the first hour everything went smoothly, a good color being fairly maintained with an average pulse-rate of 100. No ether was used. After the lapse of an hour the pulse-rate rose rather quickly to 120 and became somewhat intermittent. A few minutes later a marked pallor made its appearance, which was followed by a slight cyanosis, which in turn failed to yield to free oxygen supplied. The skin became ashen in hue; the pupils moderately dilated and sluggish. The operation was stopped, the gas turned off, and a large amount of oxygen supplied, and a fairly strong vapor of ether run into the mask with the hope that it might act as a stimulant to the respiratory center and heart. This was followed by marked improvement. The pulse-rate dropped to 104 and the intermittency disappeared.

In this case the question arises as to whether nitrous oxide is the anesthetic of choice in operations which last as long as an hour. We are inclined to believe that a majority of physicians would not so consider it.

Notwithstanding the safety of nitrous oxide gas we think it can be safely asserted that it requires as much, if not more, skill to administer it properly than is required in the use of ether and chloroform.

PHENACETINE POISONING.

There is an idea prevalent amongst the profession that all of the so-called coal-tar derivatives which are used as drugs are capable of acting very deleteriously upon the vital functions of the body, and this idea has been transmitted to the laity, to such an extent that many of this class have a very wholesome dread of the antipyretic pain-relieving drugs, notably phenacetine, or, to use its official name, acetphenetidin.

Many years ago we carried out a research upon a number of the lower animals which seemed to prove pretty conclusively that phenacetine was the least toxic of these agents, possibly because it is not so rapidly changed in the system by oxidation into para-amidophenol as is acetanilide. This also makes it less prompt in the relief of pain when it is given for this purpose. In a collection of cases, in which so-called poisoning had resulted from the administration of phenacetine, it was found that a comparatively small number of patients had been reported who manifested well-defined toxic symptoms.

In many cases in which phenacetine has been given in moderate doses the evil symptoms have developed subsequently. The symptoms have, in reality, been due to the disease itself and the drug has been made the "scapegoat," or it has been used in instances in which its administration was not wise. In any event, it may be stated that authentic instances of death being due to the administration of this drug are exceedingly rare. In severe fever of an asthenic type the use of full doses of phenacetine is doubtless harmful and may induce collapse, and this is particularly true in the tuberculous who are febrile.

Possibly the greatest abuse of acetphenetidin is from its ingestion by members of the laity for the relief of headache when the headache is not neuralgic but renal in origin. The relief afforded prevents the patient from consulting a physician, and finally, when a uremic attack ensues, the drug is considered responsible for the symptoms.

A case bearing upon these facts is reported in the *Lancet* of March 6, 1915, by Hine, who, after pointing out that instances of phenacetine poisoning are so uncommon as to justify the recording of every case, proceeds to describe a woman of thirty-seven years, suffering from chronic colitis with a previous history of dysentery, who was also being treated by a sensitized vaccine designed to relieve her of the paratyphoid organism isolated from her stools. This sensitized vaccine (5,000,000 microörganisms) was given in three injections in the course of eight days. The last dose coincided with the onset of the catamenia. The patient not having disclosed her condition to her medical attendant, she was told that for her headache she might take 5 grains of phenacetine every half-hour, until relieved, up to three doses. On the following day while menstruating and confined to bed with headache she took an unknown number of 5-grain tablets. The following morning diarrhea set in, but her temperature was normal, pulse 80, and respiration natural. She took two more 5-grain tablets, and early that evening became somewhat blue and later vomited freely. She was found to be very collapsed, wandering in her mind, and continually retching. Her pulse was 120, very feeble; her respirations were shallow and uncountable because of the constant straining and restless movements. In the course of a few hours all of these symptoms disappeared or became greatly modified. An examination of her blood did not reveal that it was materially altered, and although a specimen

of urine was examined nothing is said about its being abnormal.

It seems to us that it can be reasonably doubted whether this is really a case of phenacetine poisoning, although the cyanosis is the most indicative feature. For many years it has been known that women during the menstrual period are far more susceptible to the overeffects of phenacetine than at other times, but there are many cases on record in which doses two or three times as large as those here reported have been taken in twenty-four hours without the development of notable symptoms.

THE INFLUENCE OF PRELIMINARY NARCOTICS ON THE INDUCTION, MAINTENANCE, AND AFTER-RESULTS OF SURGICAL ANESTHESIA.

There is no topic of greater interest, year after year, to medical men than the topic of surgical anesthesia. Probably no theme has been studied and written about so much and probably no subject has been the cause of such diverse views and methods. Much of the diversity of opinion would not exist if physicians and surgeons were more in the habit of using the various anesthetics and the different methods of inducing anesthesia in such a way that each case was treated on its own merits. As a matter of fact nearly every surgeon gets into the habit of employing one method in all patients, with the result that the very best anesthetic for each individual is not always obtained. Many men at the present time precede ether and chloroform by nitrous oxide, and we believe that where ether is used this is one of the best methods of inducing surgical anesthesia, since by its means the preliminary symptoms induced by ether are entirely avoided. When it comes, however, to giving the patient a mixture of nitrous oxide and ether throughout the entire operation we see no advantage, and the disadvantage exists that the patient is under the influence of two drugs which are quite different in their physiological action. Furthermore, nitrous oxide, although so safe so far as direct mortality is concerned, should always be given by one who is trained in its use. This is particularly true if ether and nitrous oxide are used together rather than in sequence. The combination of the two also requires a considerable amount of cumbersome, complex apparatus which is difficult to handle and which often gets out of order.

To precede chloroform by nitrous oxide is a different proposition. It is universally recognized that those who struggle and those who are more or less rigid in the earlier stages of anesthesia are not favorable subjects for chloroform. It is also a well-recognized fact that the danger from chloroform is greatly increased if there is an abnormal amount of carbon dioxide in the blood, yet every one knows that when nitrous oxide is given, part of its anesthetic effect is due to an interference with the proper formation of oxyhemoglobin. Nitrous oxide greatly raises blood-pressure; chloroform greatly lowers it. The circulation is therefore first placed under stress and then depressed.

These remarks preface what we have to say in regard to the subject expressed in the heading of this leading article. In the *Proceedings of the Royal Society of Medicine* for April, 1915, we find that in the Section of Anesthetics a most interesting discussion has recently been held by skilful anesthetists on this important subject. In opening the discussion Blumfeld pointed out that four years ago a similar discussion had been held and that on that occasion the opinions which were expressed were not only various but emphatic. There were those who, enthusiastic for the novel procedure, would lead one to imagine that with the use of morphine and scopolamine, followed by open ether, the ideal in anesthesia had been achieved. There were others, equally strenuous, who maintained that increased excitement and prolonged rigidity were the main phenomena they had witnessed in connection with the use of these narcotic drugs. Blumfeld expressed the view that we should not employ any of these drugs as a routine except atropine. He has never

met with, or heard of, any ill effects from the preliminary use of atropine. This has been our own experience, and we note his statement with interest in view of the fact that fully 25 years ago we insisted upon the use of atropine as a valuable preliminary drug. We are also glad to see that Blumfeld protests against the routine use of one form of anesthesia for all patients.

Some people undoubtedly suffer more from nausea and vomiting when morphine is given than when it is not used. Blumfeld thinks that morphine and scopolamine prolong the induction of anesthesia, and particularly prolong the time necessary to produce complete muscular relaxation. This we think is not in accord with the opinion of most observers, but it is a fact that when morphine and scopolamine are used the period of unconsciousness after the operation is much prolonged, and this permits a good part of the ether to be eliminated before the patient returns to consciousness. This is a great advantage, but, on the other hand, one of the disadvantages of the preliminary use of morphine and scopolamine is that the patient once anesthetized cannot be brought back to consciousness in the event of an accident as rapidly as if ether or chloroform is employed alone. The type of cases in which Blumfeld thinks that morphine and scopolamine are chiefly indicated are highly nervous individuals, who are afraid of taking an anesthetic, and insane persons. He also thinks this plan useful in protracted nose and throat cases, and in the case of very muscular, plethoric, or alcoholic individuals, even though the operation is to be a short one.

In continuing the discussion Sir Frederic Hewitt said that for preliminary narcosis he uses morphine in the dose of 1/6 to ¼ grain, and atropine in the dose of about 1/100 of a grain. He said that of late he had become rather shy of scopolamine, except in cases in which a definite preanesthetic stupor seemed indicated, but he has never met with a case in which atropine acted disadvantageously. In operations in the air-passages the maintenance of prolonged anesthesia tends to increase the danger of septic pneumonia or bronchitis. Finally, he believes that in abdominal operations the preliminary use of morphine tends to paralyze intestinal action. It certainly retards renewed peristalsis when the intestine is subjected to any surgical procedure.

It is not possible for us to quote the views expressed by the other anesthetists who took part in this interesting debate, but Barton expressed the view that by diminishing the activity of respiration narcotics diminish the rapidity of the absorption of chloroform and ether and so delay the appearance of true surgical anesthesia, although struggling and restlessness are largely put aside.

When a very large number of persons are to be anesthetized it would appear that the preliminary use of morphine and atropine is most advantageous, since it relieves pain while the patient is waiting his turn for the surgeon and diminishes the quantity of general anesthetic which has to be employed. Barton thinks that the patient who is most prone to vomiting from morphine, after recovery from the anesthetic, is the adolescent, and he believes that there is no doubt that patients recovering from this form of narcosis require more careful watching than those who receive a straight anesthetic.

Dr. Harold Low, the President of the Section of Anesthetics, disagrees with Dr. Barton in thinking that these narcotics interfere with the absorption of chloroform and ether and believes that much less of these drugs is needful where morphine and scopolamine have been given properly.

It is interesting to note that in concluding his discussion Low added that should it be his fate at any time to have to undergo an operation he trusted that he might be given morphine and atropine. He does not say scopolamine.

In concluding this article we wish to reiterate the statement that we have already made, namely, that it is our belief that a routine anesthetic should not be followed, but that some cases should receive narcotic treatment prior to a surgical operation, while other cases are to be subjected to a different method.

THE CEREBROSPINAL FLUID IN DIAGNOSIS AND IN TREATMENT.

It is now a commonly accepted belief that the cerebrospinal fluid is secreted by the choroid plexus and makes its exit from the subarachnoid space and the ventricles by way of the arachnoidal villi, those near the sinuses and the vessels in the dura being particularly active. It seems apparent that both secretion and absorption are influenced by conditions of pressure. Normally this fluid is limpid, of low specific gravity, flowing under a pressure of 50 to 80 mm. of water, at times pink in color because of blood admixture incident to the trauma of puncture. Quincke has popularized lumbar puncture as a formal and diagnostic method. Watters (*Boston Medical and Surgical Journal,* July 22, 1915) in summarizing the known facts concerning this subject notes that the technique originally employed by Quincke twenty-five years ago is still followed by almost all workers. From the diagnostic standpoint the chemical, microscopical, and serological examination of the fluid is necessary. From the chemical side the protein estimation is of major import. Normally the fluid contains a quantity too minute to be recognized, except by the most delicate tests. Lange's gold chloride test is probably the most satisfactory one. The increased proteid content is found in inflammatory exudates, in hydrocephalus, and various forms of cerebrospinal syphilis, including tabes and paresis.

Microscopic examination is of distinctly greater import than the chemical. A count of more than 10 cells per cubic millimeter may be regarded as abnormal. A lymphocytosis suggests a tuberculous meningitis, a tabetic lesion, or a brain tumor. Polynucleosis of course suggests an acute inflammatory disturbance. The bacteriological content is of major import. The pneumococcus, streptococcus, staphylococcus, and influenza bacillus can all be recognized. Cultures must be made upon suitable media. Tubercle bacilli are difficult to find. The Wassermann test is of service both from the diagnostic and therapeutic standpoint. In cerebrospinal syphilis earnest followers of the specific therapy have noted under the microscope the progressive decrease in the cell count and a diminution in the number of bacteria following their therapeusis. Acute suppurative meningitis due either to the streptococcus or the pneumococcus, sometimes the staphylococcus, shows, as in all acute inflammatory conditions, increased pressure, increased globulin, an excessive cell count. Lumbar puncture often causes a marked amelioration in symptoms. Nor is there any objection to this procedure being many times repeated. Watters argues that thus are brought fresh supplies of fluid containing increased amounts of antibodies. The fluid from tuberculous meningitis is clear or at most slightly opalescent, and contains an excess of globulin and of lymphocytes as a rule. Indeed, this finding is highly suggestive in the young of tuberculous meningitis. The diagnosis of cerebral hemorrhage can often be made by lumbar puncture, the fluid showing a dark color which lasts for many days.

Concerning syphilis Watters has a word of commendation for the many physicians who refuse to dismiss as cured any case of syphilis without first demonstrating a perfectly normal spinal fluid. He holds that if in addition to repeated Wassermann tests of the blood this course be followed, and if when any evidence of the disease is found in the spinal fluid proper therapeutic measures are taken, the incidence of cerebrospinal syphilis, tabes, and paresis will be very greatly diminished, since in the early stage the organisms are comparatively accessible and much more amenable to treatment than when they become deeply buried in relatively avascular tissues. It is to be regretted that there is no clinical evidence as to the soundness of this dictum.

Cerebrospinal syphilis, characterized by a variety of manifestations according to the varied location of the infection, exhibits the highest cell counts of any of the syphilitic nerve diseases, often running up to 1000 and necessarily indicating a meningeal irritation. The Wassermann is not always positive in the earlier stages. Later there

is a diminution of the cell count, although the globulin will continue in excess. The Wassermann of the spinal fluid is likely to become positive in the later stages of the disease, if it was not so at first. In tabes the fluid Wassermann is negative in about one-half the cases, although the serum Wassermann is as a rule positive. There is usually an increased cell count. In proportion to the excess of globulin and the high cell count is at least theoretically the hopefulness of the active therapeusis.

A NEW THEORY OF THE CAUSATION OF ENTEROSTASIS.

Enterostasis, to which so many of the ills to which flesh is heir are ascribed—some experimenters indeed holding that old age is the direct consequence of this condition—is commonly due to a muscular asthenia involving both the involuntary system of the alimentary canal and the skeletal system, the latter by its relaxation allowing of such misplacements that even with the propulsive force of the stomach and intestines unimpaired in vigor delay would necessarily follow. Indeed, ptosis is commonly regarded as a very important factor in intestinal stasis. It is undoubtedly true that ptosis of a moderate extent is the almost invariable accompaniment of senility, the weakened parietal muscles and the stretched fascia allowing a globular protuberance of the viscera from the pelvis, thus dragging upon the mesenteric attachment. That there are other factors operative can be readily deduced by one who will give even a superficial consideration to the clinical cases which present themselves. It is Keith's purpose (*West London Medical Journal*, July, 1915) to investigate these other factors. It is, of course, recognized that food is normally delayed at certain portions of the alimentary canal. Keith states that along the great intestine there appear to be three normal points: (1) Near the commencement of the transverse colon, leading to the filling of the cecum and ascending colon; (2) at the rectocolic junction, leading to accumulation in the pelvic colon; (3) above the anal canal, leading to accumulation in the rectum. We have been in the habit, for some time past, of speaking of abnormal delay above the ileocolic junction as "ileal stasis;" clinicians also speak and write of "duodenal stasis," "gastric stasis," stasis of the proximal colon, and stasis of the distal colon; we may, therefore, legitimately admit esophageal and rectal stasis to the same category. In the present state of our knowledge we may regard all of those enterostatic conditions as morbid exaggerations of normal delays which take place in the passage of alimentary contents, and may conveniently group all of them under the name of "enterostasis."

He began his research with the idea of throwing more light on that system of tissues in which the heart-beat arises and through which it is propagated throughout the auricles and ventricles. The bowel, because of its structure and manner of action, seemed very likely to yield information regarding the early history of the "nodal" and "bundle" systems of the heart. Keith selected the ileocecal junction of the rat's bowel as the site of initial inquiry, believing that if a special tissue were present in the bowel it should be found at that site. He further inferred that if "nodal" tissue did occur there it must be directly interposed between the muscle fibers on the one hand, and with processes from true ganglionic cells on the other.

In studies of comparative anatomy Keith has been able to demonstrate a true and direct union between nerve and muscle fibers, in the sinoauricular node. An examination of the ileocecal junction of rat's bowel showed numerous branched cells with processes which united with muscle cells, on the one hand, and with the processes of true ganglionic cells on the other. These cells Keith regards as possibly representative of the nodal tissue of the heart. It was evident that the "ileocolic collar" in which these cells were found was merely a local specialization of the myenteric (Auerbach's) plexus. Keith's further studies were made upon human specimens sent by Lane, Moynihan, and Smith; preparations

of the alimentary tract of Australian mammals sent by Mackenzie; preparations of the alimentary tract of the elephant sent by Wright; and preparations of this tract of many vertebrate animals sent by Wilson. These studies convinced him that the myenteric plexus is not a simple structure composed of merely nerve cells and nerve fibers, but one of a composite texture. There are ganglion cells in the plexus, and there is an ample network of particularly fine fibers. But there is also an abundant third element in the plexus—the branching intermediate cells which have been already mentioned, and which appear to become continuous with processes of certain groups of muscle cells on the one hand, and on the other with the branched processes of ganglionic cells contained in the nerve fibers of the plexus. Indeed, it is often difficult to say whether a certain intermediate branched cell is to be regarded as a muscle cell or as one of the cellular elements of the plexus, so alike are they in form and in staining reaction.

Keith, therefore, adopted the working hypothesis that the myenteric plexus represents a nodal and conducting system, the intermediate branched cells being capable of assuming the appearance of either a nerve element or a muscle element. If the myenteric plexus represents in the intestine a system which corresponds to the nodal and conducting system of the heart, then it is also to be expected that both systems should be developed in a corresponding manner. The bundle system of the heart, it will be remembered, arises from the muscle-forming stratum which lies immediately beneath the endocardium. An examination of the developing human intestine shows that the myenteric plexus arises in a corresponding manner. A section across any part of the intestine of a human fetus in the fourth month of development shows the two muscular coats—longitudinal and circular—separated by an intermediate cellular layer, which is clearly myogenic in nature, for one can see muscle cells being differentiated from it and being added to the longitudinal coat on the one hand, and to the circular coat on the other. It is out of the same intermediate cellular layer that the myenteric plexus is developed.

As a result of further studies Keith expresses his conviction that there exists, at the gastroesophageal junction, a main nodal center at which the rhythmical contractions of the stomach are initiated; he was further struck by the rich development of the myenteric plexus in the duodenum in the neighborhood of the ampulla of Vater. One could trace the nerve tissue from the solar plexus forming unions with it, and one could see, too, that the ampullary sphincter was supplied by a direct extension from the myenteric tissue of the duodenum. He believes on these anatomical grounds that the area of nodal tissue which may serve as a main center for the duodenum is placed proximal to the entrance of the common bile duct, in the area lying against the head of the pancreas. In studying the cases seen by Lane and Moynihan he noted that in cases of colitis there was the same fibrosis of the muscular coat as one sees in the myocardium of diseased hearts, a fibrosis in which meshes of the myenteric plexus were often involved. It was at this stage of the investigation that Keith learned of Alvarez's research showing that the commencement of the second part of the duodenum dominates the rhythm for the whole duodenal loop.

The evidence is fairly complete which points to a gross derangement in the action of the musculature of the transverse, descending, and iliac colons in cases of stasis of the great bowel. There is a general agreement among clinicians that in most cases of colic constipation there is a marked increase in the tonus of these segments of the colon; in many cases the muscle has become almost spastic in its manner of working.

When we transfer from the heart to the alimentary tract not only the anatomical and physiological data relating to its nodal and conducting system, but also our knowledge of cardiac pathology of heart-block, of auricular fibrillation, of extra-systole, and of delay in conductivity, we seem to reach a more rational explanation of the motor derangements of the alimentary tract. One has to remember a fact with which physiologists are familiar, namely, that all the

non-striated muscle of the body—the musculature of the alimentary tract, of the bladder, uterus, and ureter—has the same property as cardiac muscle, a power of rhythmical contraction which it continues to exercise as long as it is alive.

Bayliss and Starling in the *Journal of Physiology* for 1899, vol. xxiv, p. 99, demonstrated the intrinsic beat of bowel muscle; they found that every piece of bowel possessed a double rhythm or beat, a rapid one in which contraction waves arose at the rate of ten to twenty a minute, and a slow and concurrent one in which the contraction waves arose at the rate of one or two a minute. They further showed that the slow beats gave rise to true peristaltic waves. The more rapid and slight rhythm was concerned with division and mixing of the intestinal contents. It is also probable, as Mall originally indicated, that the more rapid and rhythmical contraction is directly concerned in the maintenance of the portal circulation. The musculature of the whole intestinal tract has its pulse. The appendix, although it has a peculiar arrangement of the myenteric plexus and evidently possesses a peculiar mechanism for becoming filled and emptied, has also a double rhythm of the same kind as is found in the rest of the alimentary tract.

In passing along the alimentary tract food is propelled through a series of zones or segments, each furnished with its own pacemaker and its own rhythmical contractions. In the heart we find two such zones, an auricular and a ventricular; in the normal heart the sinoauricular node is the master pacemaker. But a block or imperfection in conduction may occur between the two zones of the heart, with the result that "back-pressure"—a venous stasis—is produced. Now seeing the similarity between the cardiac and alimentary motor mechanisms, we do not seem overpresumptuous if we suppose that irregularities may occur in the nodal and conducting system of the alimentary canal—irregularities of the same kind as are known to occur in the heart. When such irregularities or blocks do occur we should expect to find them at the points where one rhythmical zone or area passes into the succeeding zone. That is exactly what we do find. We find a block where the esophagus joins the stomach; we find another where the gastric zone ends and the duodenal begins; we find it where the duodenal zone passes into the jejunal, and where the jejunoileac passes into the ileocolic. We find a block may occur at any point of passage from a lower to a higher rhythm. At several of these junctional points sphincters are situated, and while it is not denied that the mechanism of such sphincters may become disordered and cause alimentary stasis, it will probably be found that a disturbance in the action of a sphincter is secondary to a disturbance in the excitability and action of the whole rhythmical zone or segment to which it belongs.

Further, it is clear that to obtain an orderly propulsion of the food along the whole length of the alimentary canal these various rhythmical zones must be closely coördinated in their action, and there is a growing body of evidence, both experimental and clinical, that points to a very close coördination by means of a complicated system of reflexes. Disturbance in any one segment upsets the rhythm in all the segments. Bayliss and Starling observed that distention of the duodenum inhibited the action of the ileum; surgeons are familiar with the fact that a duodenal disturbance upsets the rhythm of the stomach. From the facts already mentioned it is easy to see that disturbance in the excitability and rhythm of the pacemaker of the cecum will be reflected to the lower ileum. One can understand, on the hypothesis presented, how stasis in the great bowel may be followed by ileal, duodenal, or gastric stasis, or how a disturbance of the conductivity or excitability of any of the rhythmical zones may ultimately give rise to stasis in all.

This theory of stasis, based on a profound study, has much to commend it. If it be true it will doubtless be the basis of further researches directed toward remedying abnormal conditions. The direction which these researches should take is not at present clear.

REPORTS ON THERAPEUTIC PROGRESS.

STREPTOCOCCIC SORE THROAT, AND THE EFFECT OF VACCINES IN ITS TREATMENT.

The *Medical Record* of May 15, 1915, contains an article by MELLON in which he reaches these conclusions:

1. An early examination of cultures from acute sore throat is valuable because it precludes any overgrowth by contaminating organisms, and because it often gives a clue to the virulence and toxicity of the infecting agent.

2. Although of advantage in acute and subacute cases, it is of no value in chronic ones.

3. Our ideas as to what constitutes a normal mouth and throat must undergo revision. Because one does not have any condition in his oral cavity which causes pain is not proof of the bacteriological normality of the cavity. His tonsils make him a streptococcus or diphtheria carrier, just as surely as one who harbors the typhoid bacillus is a carrier of that organism. It is now well known that streptococci may develop a focus in the gums and around the roots of the teeth, as well as in the tonsils.

4. Examinations of the oral cavity should look to a more careful interpretation of the organisms found there. The relation of hemolytic cocci to the arthritides and the S. viridans and the pneumococcus to endocarditis (Rosenow) necessitates the use of blood agar for this work, as it affords a real clue to that particular member of the group with which one has to deal. In the chronic cases cultures of material from the crypts and animal inoculation may often clear up the diagnosis of many so-called cryptogenic infections.

5. The acute cases of streptococcic sore throat respond very quickly and decisively to a vaccine of immunizing powers. Provided the vaccine was used early, it has not been the writer's experience so far to see any case of this condition develop any of the numerous complications which may sometimes occur.

It is not the writer's intention to laud the merits of stock vaccines because, generally speaking, the autogenous are the logical therapeutic agent. But certain strains of this organism often yield much better immunizing results than are seen with the autogenous vaccine. If one is fortunate enough to have such a strain at the time it is needed, there is no justification for the autogenous preparation; otherwise it would seem advisable to obtain the latter as early as possible.

It is true that many cases apparently recover without any treatment, but if the many sequelæ could be followed up in every case, we might revise our notions on the self-limiting ability of this disease.

Because the apparent symptoms of one attack have been eliminated it is by no means a proof that such an attack has not laid the body liable to the more stealthy changes which result from the continual absorption and ingestion of these organisms.

GASTRIC AND DUODENAL ULCER AND ITS NON-SURGICAL TREATMENT.

SIPPY writing in the *Journal of the American Medical Association* of May 15, 1915, tells us that the principle involved in the treatment advocated consists essentially in efficiently shielding the ulcer from the corrosive effect of the gastric juice. This is accomplished by maintaining an accurate neutralization of all free hydrochloric acid, thus rendering the digestive action of the gastric juice inert from 7 A.M. until about 10.30 P.M., or during the entire time that food and the accompanying secretion are present in the stomach. In addition, it is accurately determined whether an excessive night secretion is present. If so, this is removed each night until the irritability of the gastric glands has subsided. This applies almost entirely to cases of duodenal and pyloric ulcer that have been associated with stagnation of food and secretion for one or two months, and longer. Such cases almost invariably are attended

by a more or less copious continued secretion during the night, which should be removed by aspiration two or three times each night, if necessary. Usually after three or four days of accurate control of free acidity the excessive night secretion disappears. Subsequently the normal quantity (about 10 Cc.) of gastric juice present in the stomach during the night is left undisturbed.

The neutralization of hydrochloric acid is accomplished by frequent feedings and the use of alkalies in carefully regulated but adequate quantities. Experience in applying the method to all types of individuals under widely varying conditions has abundantly demonstrated that the corrosive or digestive action of the gastric juice can be thus practically annulled until healing of the ulcer is accomplished. The conditions for the healing of peptic ulcer thus obtained are rendered as ideal as they can be made to be in the light of our present knowledge and understanding.

Space makes it impossible to give the details of the management in this paper. Briefly stated, the patient remains in bed for from three to four weeks. Unless some serious complication is present, some or all of his regular work may be done at the end of four or five weeks. A wide variety of soft and palatable foods may be given. The following plan of diet has been found most adaptable: Three ounces of a mixture of equal parts milk and cream are given every hour from 7 A.M. until 7 P.M. After two or three days soft eggs and well-cooked cereals are gradually added, until at the end of about ten days the patient is receiving approximately the following nourishment: 3 ounces of the milk and cream mixture every hour from 7 A.M. until 7 P.M. In addition, three soft eggs, one at a time, and 9 ounces of a cereal, 3 ounces at one feeding, may be given each day. The cereal is measured after it is prepared.

Cream soups of various kinds, vegetable purées, and other soft foods, may be substituted now and then, as desired. The total bulk at any one feeding while food is taken every hour should not exceed 6 ounces. Many of the feedings will not equal that quantity. The patient should be weighed. If desired, a sufficient quantity of food may be given to cause a gain of 2 or 3 pounds each week.

A large variety of soft and palatable foods may be used, such as jellies, marmalades, custards, creams, etc. The basis of the diet, however, should be milk, cream, eggs, cereals, and vegetable purées. Lean meat is not given during the period of accurate observation, since it interferes with the tests for occult blood in the stool and aspirated stomach contents.

The acidity is more easily controlled by feeding every hour and giving the alkalies midway between feedings. The acidity may, however, be controlled by feeding every two, three, or four hours. The writer has maintained complete control of the free hydrochloric acidity in several cases by feeding three times daily. In most cases, however, the plan of feeding every hour is best.

It is only fair to state that the views expressed and the methods described in 1911 were as radical as the writer then dared publish. Since that time numerous slight modifications of procedure, some of which were then on trial and others of later development, have become thoroughly established in his practice.

The uncomfortable preliminary starvation period serves no purpose when the acidity is controlled, and has, therefore, been entirely abandoned. Slightly larger doses of alkalies than were then advised were being regularly employed. The practice of maintaining an absolutely accurate control of the free hydrochloric acidity during the entire time that food and the accompanying secretion are present in the stomach has become thoroughly established. This requires the administration of varying quantities of alkalies, corresponding to individual cases. Also, in addition to giving an alkaline powder midway between feedings, the powders are continued every half-hour after the last feeding until 10 P.M. In all cases of pyloric obstruction from duodenal and pyloric ulcer it has been found ad-

visable to empty the stomach of all remaining food and secretion at about 10.30 P.M., thus removing the stimulus to an excessive night secretion. In most cases a short time after treatment is begun the stomach will be found empty at that time. The management of excessive night secretion has already been described.

Cases of stomach ulcer unassociated with stagnated food and secretions are usually controlled by feeding every hour and giving a powder containing 10 grains each of heavy calcined magnesia and sodium bicarbonate, alternating with a powder containing 10 grains of bismuth subcarbonate and 20 or 30 grains of sodium bicarbonate, midway between feedings. Cases of pyloric and duodenal ulcer that have been associated with stagnation of food and secretion longer than two months almost invariably require larger quantities of alkalies.

Heavy calcined magnesia has approximately four times the neutralizing power of sodium bicarbonate. Since its neutralizing effect is prolonged compared with that of sodium bicarbonate, and for other reasons, calcined magnesia should be used between as many feedings as possible. An uncomfortable diarrhea usually prevents its exclusive use as a neutralizer. Other stable alkalies similar in action to calcined magnesia are being carefully tested.

In a few cases of duodenal ulcer with high-grade obstruction it has required the equivalent of 100 grains of sodium bicarbonate every hour, midway between feedings, and three doses with intervals of one-half hour after the last feeding, at 7 or 8 P.M., to neutralize all the free hydrochloric acidity.

The average length of time that a patient with peptic ulcer should be under the accurate control and observation of the physician is about four weeks. During this period, if observations have been carefully and intelligently conducted, the finer points essential to a complete diagnosis of peptic ulcer, including such conditions and complications that may attend the ulcer, will have been determined, and the patient will have learned how to manage himself accurately. Thus the gratifying results to be obtained by the management advocated are secured.

It has been the writer's experience that in the management of no other serious disease is it so easily possible to obtain the intelligent coöperation of all classes of patients. The reasons are probably of this nature: The things required of the patient during the after-management are straightforward and relatively simple; the sufferings of the patient before treatment have often been so severe that he usually requires no further stimulus to do his part. Fortunately, the most accurate coöperation is usually secured from patients who have long suffered from the obstructive type of duodenal or pyloric ulcer.

The non-obstructive type of gastric ulcer requires relatively little attention to details compared with the obstructive type of duodenal and pyloric ulcer. The dosage of alkali required to control the acidity is smaller, and it is seldom, if ever, necessary to remove the remaining food and secretion at bedtime.

Ideal conditions for the healing of peptic ulcer are maintained when the aspirated stomach contents show absence of free hydrochloric acid during the entire time that food and the accompanying secretion are present in the stomach, and all excessive night secretion is controlled.

Experience has shown that when the free acidity is found controlled late in the afternoon and just previous to taking the powders or feedings, the acidity is likely to be controlled at all other times during the feeding hours.

It is not difficult to determine the amount of alkali required between feedings to control accurately all free acidity. If not controlled the first few days by giving the usual amount, then the dose is gradually increased until the acidity is regularly found controlled.

It should be understood that the presence of free hydrochloric acid now and then for a few minutes each day does not seriously interfere with the healing of the ulcer. Such short periods during which corrosion

of the ulcer may be possible are as nothing compared with the duration of corrosion to which duodenal and pyloric ulcers are subjected after gastroenterostomy. In the ordinary surgical treatment of these conditions such ulcers are subjected to the corrosive action of the gastric juice during the whole period of normal digestion, which occupies many hours each day. The majority of pyloric and duodenal ulcers treated by gastroenterostomy show few symptoms after the operation, and such ulcers probably usually heal in the course of time, the same as the majority of the non-obstructive type of gastric ulcers usually heal without treatment. In either case, however, the conditions for healing are far from ideal.

THE GERMAN USE OF ASPHYXIATING GASES.

The *British Medical Journal* of May 1, 1915, tells us that its correspondent in Northern France writes from Boulogne under date of April 28, stating that "a considerable number of men who are suffering from the effects of asphyxiating gas used by the enemy in the country near Ypres have reached the Boulogne hospitals. What proportion these cases bear to the total number of men affected by the gas it is impossible to say. Some of the graver cases have remained in the clearing hospitals, others died on the battle-field itself, and it is probable that very many of the lighter cases have been sent on to more distant hospital bases. Among those that have arrived at Bolougne there have already been several deaths, and in one case I was able to observe for myself some of the physical results. Around the larynx, including the epiglottis, was a band of acute inflammation, and the trachea was intensely irritated. The kidneys were cyanotic—that is to say, they presented the deep color seen in cases of asphyxia from any cause. The clinical features are those of acute bronchopneumonia, and in grave cases there is pulmonary edema. The gas appears to be evolved in some special apparatus, and to be projected from a tube toward the trenches of the Allies when the wind is blowing toward these from the German. It appears in the form of a yellowish-brown smoke, which floats slowly along close to the ground, and is easily visible from a considerable distance. If it reaches any trenches when comparatively undiluted it rapidly causes choking. Otherwise the immediate phenomena are smarting of the eyes and violent coughing. The men's buttons turn green and their bayonets black. All these phenomena are compatible with a belief that the gas is chlorine, a body about two and a half times heavier than air, and dangerous to life in quite low admixtures. If so, the remedy would seem to lie in the use of respirators, formed by placing over the mouth and nose a handkerchief dipped in solution of sodium bicarbonate. The adoption of this means of protection would seem to offer insuperable difficulties, since the gas could only be effectively used when trenches were quite close to one another, or possibly for discharging against a force attacking trenches which have not been submitted to a preliminary artillery bombardment."

It was on April 22 that a number of the French troops were overpowered and rendered incapable of defending their position, and on April 26 the War Office issued a communication stating that "it is officially reported on medical evidence that Canadian soldiers have lost their lives in the recent fighting, not from wounds, but from poisoning by gases employed by the enemy—which is a means of warfare contrary to the Hague Convention." Sir John French reported on April 23 that the enemy had made "use of a large number of appliances for the production of asphyxiating gas. The quantity produced indicates a long and deliberate preparation for the employment of devices contrary to the terms of the Hague Convention, to which the enemy subscribed."

The War Office sent over to France Dr. J. S. Haldane of Oxford, than whom there is no higher authority living on questions of this order. He reported on April 27 that with Sir Wilmot Herringham, consulting

physician to the British force, he had examined several men from Canadian battalions, who were at the No. 2 Casualty Clearing Station, Bailleul; they were struggling for breath and blue in the face. On examining the blood with the spectroscope and by other means, he ascertained that the blueness was not due to the presence of any abnormal pigment. There was nothing to account for the cyanosis and struggle for air but the one fact that they were suffering from acute bronchitis, such as is caused by inhalation of an irritant gas. In one case, in which a post-mortem examination was conducted, in the presence of Dr. Haldane and Sir Wilmot Herringham, by Lieutenant J. W. McNee, assistant to the Professor of Pathology in the University of Glasgow, it was shown that death was due to acute bronchitis and its secondary effects, and there was no doubt that the bronchitis and accompanying slow asphyxiation were caused by the irritant gas. On the previous day Lieutenant McNee had examined the body of a Canadian sergeant, who had died in the clearing station, and in this case very acute bronchitis and edema of the lungs had caused death by asphyxiation. Captain Bertram, of the 8th Canadian battalion, who was in the clearing station suffering from the effects of the gas and from a wound, stated that when in a support trench about 600 yards from the German lines, he had observed first a white smoke rising from the German trenches to a height of about three feet, and then in front of the white smoke appeared a greenish cloud not rising to more than seven feet, when it had drifted along the ground to the British trenches. He made a counter-attack about fifteen minutes after the gas came over, and saw twenty-four men lying dead from the effects of the gas on a small stretch of road leading from the advanced trenches to the supports. He was much affected by the gas still present, and felt as though he could not breathe.

Dr. Haldane states that the symptoms and other facts so far ascertained point to the use by the Germans of chlorine or bromine for purposes of asphyxiation. Prof. H. B. Baker, F.R.S., Professor of Chemistry in the Imperial College of Science and Technology, London, is making further inquiries from the chemical side. At present the evidence seems to be generally in favor of the view that the gas used was chlorine, which at ordinary temperatures and pressures has a greenish-yellow color. In France the opinion seems to be more in favor of bromine, which in a gaseous state is still heavier, and of a yellowish-red color. It is pointed out that Germany commands large stocks of bromine, obtained from the mother liquors of the Stassfurt potash industry. Owing to the competition with bromine made from the salt works in America the price has greatly declined. At one time it was as high as M. 90 a kilogramme, but was recently obtainable at about M. 1.6 a kilogramme, which is approximately about 8d. a pound.

Very few cases of poisoning by bromine or chlorine vapor have hitherto been recorded, and all of them have occurred accidentally in laboratories or chemical works. Dr. Haldane states that there are also facts pointing to the use in German shells of other irritant substances, though in some cases at least these agents are not of the same brutally barbarous character as the gas used in the attack on the Canadians. The effects are not those of any of the ordinary products of combustion of explosives. On this point the symptoms described left not the slightest doubt in his mind. The War Office has issued a request for respirators, to be sent in packages of not less than 100, to the Chief Ordnance Officer, Royal Army Clothing Department, Pimlico. They may be either of two patterns: (1) A facepiece (to cover the mouth and nostrils) formed of an oblong pad of bleached absorbent cotton-wool about 5¼ inches by 3 inches by ¾ inch, covered with three layers of bleached cotton gauze, and fitted with a band, to fit round the head and keep the pad in position, consisting of a piece of half-inch cotton elastic 16 inches long attached to the narrow end of the face-pad so as to form a loop with the pad. (2) A piece of double stockinette, 9½

inches long, 3½ inches wide in the center, gradually diminishing in width to 2½ inches at each end, with a piece of thick plaited worsted about 5 inches long attached at each end, so as to form a loop to pass over the ear.

THE TREATMENT OF APHASIA.

The *Practitioner* for May, 1915, contains an article by KINNIER WILSON on this topic. He well says that when the practitioner is faced with a case of aphasia it is often difficult to say what the outlook really is. Some severe cases clear up unexpectedly; others, slight from the beginning, remain unmfluenced. In the endeavor to give an accurate prognosis, the following considerations are worthy of attention.

1. It is true, as a general rule, that the more advanced the age of the patient at the onset of aphasia, the less likely is improvement to occur. Nevertheless, there are well-marked exceptions to this rule. Some children, after an encephalitis causing aphasia, never make that improvement which we expect; and some old folk make a rapid recovery. In this connection a further consideration must be mentioned: the longer the interval between the stroke and the reawakening of speech, the less likely is the improvement to be material. To this generalization the writer attaches much practical importance.

2. Still more depends on the severity of the original attack. In a large class of cases the aphasia may be regarded as strictly transient, and in these the prognosis naturally is good. Reference is here directed to certain attacks of Jacksonian epilepsy, migraine, cerebral arteriospasm, incomplete thrombosis, endarteritis obliterans, certain toxic and toxi-infective conditions, congestive attacks in general paralysis, etc. In such cases the aphasic disturbance may clear up entirely in a very short period. It is well, on the other hand, not to forget that transient aphasia from cerebral vascular disease may become permanent if an ictus occurs.

In an elderly patient with aphasia definitely established, the following points may be put before the physician as worthy of remark:

(*a*) If there is little or no indication of generalized cardiac, arterial, or renal disease, the outlook is better than if such systems show signs of degeneration.

(*b*) Should the aphasia be unaccompanied by any paralysis, facial, brachial, hemiplegic, etc., the chances of improvement are better than otherwise. Palsies are simply an indication of the degree of the lesion, and the larger the lesion, the less likely is improvement to take place.

There is evidence to show that some cases of aphasia improve because of functional restitution in parts of the brain damaged but not destroyed by the lesion. In other instances the evidence suggests that auxiliary speech mechanisms develop in undamaged areas of the cerebrum, a condition of functional compensation.

In all cases of aphasia, treatment should be directed along two lines: (1) the treatment of the causative morbid process; and (2) the treatment of the symptomatic condition once it is established.

1. The common causes of aphasia are embolism, hemorrhage, thrombosis, inflammation, and tumor. Whenever the physician has made his diagnosis of the underlying mischief, he should prosecute treatment actively. It is unnecessary to indicate in this article the appropriate measures to be adopted in each of the above forms of intracranial disease.

2. Treatment may have to be directed to the restoration of speech by functional compensation. A number of cases have now been recorded in which the organs of speech were reëducated *de novo*, with excellent results. The evidence favorable to the reeducation method is ample enough to render its comparative neglect by the profession rather inexplicable. Naturally, in order that it may be prosecuted to a successful issue, the combination of a suitable case, a diligent pupil, and an enthusiastic and patient teacher is almost a *sine qua non*, and doubtless such a combination is not

always to be found. Yet even a modicum of success is worth striving for, and it may be hoped that henceforward the physician will address himself to the task with greater devotion and assiduity.

In all cases the method is essentially one of imitating the procedures by which a child first learns the elements of speech. In order to give the reader a practical acquaintance with methods in vogue, one may be allowed to cite *in extenso* the technique of Dr. Charles Dana, of New York:

"(*a*) Repeat five exclamatory words, such as 'ah,' 'oh,' or other exclamations expressing joy, anger, or other emotions. Repeat after teacher ten monosyllabic nouns or pronouns. Repeat ten polysyllabic nouns. Repeat ten verbs. Each time a noun is named, let the patient see the object, feel it, and see the written or printed name on a piece of paper before him, thus stimulating visual, auditory, and tactile memories at the same time.

"(*b*) Repeat the letters of the alphabet, these letters being held in front of him. Repeat letters of the alphabet after writing and looking at each one. Repeat the numerals from 1 to 20. Repeat them while looking at the figures. Write and repeat the figures.

"(*c*) Repeat ten simple qualifying adjectives, such as white, black, red, smooth, soft, rough. At the same time, let him see the object and color, or feel the same.

"(*d*) Later, let him try to repeat sentences of three words, in which the noun is joined to the adjective—*e.g.*, 'book is red,' 'box is white,' etc.

"(*e*) If the patient has any musical capacity, sit him at a piano and hum the notes of the piano, going through an octave, and then let him try to hum a tune, striking a note at the same time. Finally, teach him to sing the tune through, and then introduce the possible words. Some patients can sing before they can talk.

"(*f*) Copy sentences made up of the words he has been taught. Let him have an ordinary copy-book and have the copy at the top of the page. Let him fill a page every day, trying at the same time to pronounce the words as he writes them. Have him copy first the familiar nouns, and then the simpler verbs, then the simple adjectives: fianlly, let him copy sentences. Take a small vocabulary, and repeat from this, not trying to enlarge too soon.

"(*g*) Write the letters of the alphabet, and as the patient writes them get him to try to repeat them. Do this without a copy, if possible. Then let him write the words to dictation, using the same vocabulary above referred to. Finally, let him try to write short sentences to dictation, then try to read them after he has written them, with assistance at first, then without.

"(*h*) Write numbers 1 to 20, and say them out loud when written.

"(*i*) The patient should allow himself to be read to for a short time twice a day, and he should try also to repeat a quarter of a page every day."

Another method is a more strictly phonetic one, and consists in teaching the patient the letter-sounds of each vowel and consonant. A combination of this procedure with lip-reading is often of value in motor aphasia. The patient is shown by direct lip-reading how to place the lips, tongue, etc., for the pronunciation of each letter-sound.

What has been said hitherto has a bearing rather on the treatment of motor than of sensory aphasia. It has been held that the latter variety is more difficult to treat successfully—*i.e.*, that once sensory aphasia is established, improvement under treatment is less likely to occur. In a case of word-deafness, for instance, the aim of the teacher, physiologically expressed, is to develop an auxiliary word center in the right hemisphere and to bring it into functional relation with the motor speech center in the frontal part of the left hemisphere speech area. In word-blindness similar lines of attack are indicated. The reader can understand that work of this sort entails the expenditure of much time and patience, but in cases that have come under the writer's own observation, and in certain recorded cases, extremely good results have been obtained. The tactics pursued

are somewhat as follows: The patient first of all learns the alphabet, attention being concentrated on each letter in turn. As this is being done, the teacher pronounces the letter. Eventually the patient names the letters himself, being taught also by lip-reading to do so. Thus afferent impressions from more than one sense avenue are being utilized together. The next step is to tackle monosyllabic words, which the patient learns to spell out letter by letter, while the teacher pronounces each letter and the word as a whole. Again he utilizes the lip-reading method to assist the patient as the latter endeavors to read the word aloud. A number of short lessons during the day are better than one long one.

It is frequently observed that aphasic patients are peculiarly apt to speak in the "telegram style," omitting parts of speech which may not be necessary for comprehension but are, nevertheless, essential for correct speaking. It is more particularly prepositions and articles which are omitted, and nothing really shows the poverty of the patient's language so much as their omission. The teacher should apply himself strenuously to get the patient to reacquire these all-important articles, conjunctions, prepositions, and auxiliary verbs from the outset. In a word, the grammar of language has to be learned again, as it was learned at school.

REPORT ON THE ALLEN TREATMENT OF DIABETES.

In the *Boston Medical and Surgical Journal* of May 13, 1915, HILL and SHERRICK state that their treatment of diabetes had been to start the patient off with a fairly high carbohydrate intake, about 100 grammes with 100 grammes of protein and 250 grammes of fat, or more, and gradually to work down from this, first cutting down the carbohydrate, and then, if the patient did not become sugar-free, cutting down the protein. The fat was always kept high, and many patients received over 4000 calories, the old idea being to make the patient gain weight if possible. If the patient lost weight they were afraid, and the writers believe that one of the most important things that Dr. Allen has brought out is that a diabetic can lose a good deal of weight with considerable advantage to himself and no harm. They also used "vegetable days" and "oatmeal days"—usually with rather poor results. As to starvation they are afraid of it, although in one or two cases they used a semi-starvation day, with thick cream and black coffee, but never for periods of longer than one day at a time. With this treatment diabetics did fairly well, but the process of getting them sugar-free was a tedious one, and a good many cases continued to excrete 0.1 per cent or 0.2 per cent of sugar no matter what was done.

They do not discuss the theory of the Allen treatment—he did that in his original paper—but merely report their very successful series of cases, in order to show that his treatment is simple, safe, and very efficacious in rendering and keeping a patient sugar-free, in a much shorter time than was possible by the old method; that anybody can do it, and that there is no danger of coma.

The writers' method of treatment, following Dr. Allen's very closely, is as follows: As soon as the patient enters the ward he is put on house diet without extra bread or potatoes, and kept on this for two days, to determine his tolerance for ordinary diet and the severity of his diabetes. On the third day he is put to bed and given nothing but black coffee with one ounce of whisky every two hours from 7 A.M. to 7 P.M.—7 ounces of whisky in all—representing about 800 calories. The whisky is usually well borne, although in one or two of the female cases it had to be omitted as it caused nausea. If there is much acidosis, as indicated by the amount of diacetic acid and acetone in the urine, soda bicarbonate is given, otherwise nothing.

The patient is kept on this regimen until he is sugar-free; in most of their cases it took either two and a half or three days to accomplish this. The loss of weight is very slight; the relief of symptoms, such as pruritus, polydipsia, etc., is very striking;

and they have never seen any indication of acid poisoning in the cases they have treated by this method. On the whole, patients seem to bear starvation remarkably well. They have never starved a case longer than three days, but would not hesitate to do so if there is any sugar in the urine at the end of this time.

As soon as the patient is sugar-free he is given a "vegetable day"—*i.e.*, vegetables containing not over 5 per cent of carbohydrates, boiled twice, with a carbohydrate content of about 15 grammes after boiling (in the boiling about half the carbohydrate is lost). After a single vegetable day the diet is changed to:

Carbohydrate	15 grammes.
Protein	25 grammes.
Fat	150 grammes.

From this the diet is slowly raised, increasing first the fat, then the protein, and lastly the carbohydrate. The fat is never raised above 200 grammes and the calories seldom above 2200. On this the patients hold their weight, feel well, and usually remain sugar-free. They do not gain weight; but as Dr. Allen says, it is much better to be lean and healthy than to be fat and carry one or two per cent of sugar. Indeed, in some of the more robust cases who are obese, it seems desirable to get rid of this fat, and the calories are kept low on this account. This is supported by Dr. Allen's experiments with his depancreatized dogs, for he found that as soon as he tried to make these dogs grow fat they died, whereas if he fed them on only a small amount, and was content to let them stay very lean, they did very well.

The authors' series is small, and perhaps they have been lucky, but in no case have they had any unfortunate results—never any sign of coma. In every case the patient has become sugar-free and has stayed so, on a reasonable diet which enabled him to hold his weight.

Some of these were very severe cases of diabetes—young people, whom they had treated before by the old method and could not get sugar-free.

When the patient is discharged from the ward he is given written diet slips with two or three menus which he can use on different days, figured out carefully to correspond with his tolerance. The two most important things to remember are the following:

First, do not raise the diet too quickly after starvation, and pay just as much attention to the protein intake as to the carbohydrate.

Second, do not worry if the patient loses weight; it will not hurt him.

CALORIMETRIC OBSERVATIONS ON THE METABOLISM OF TYPHOID PATIENTS WITH AND WITHOUT FOOD.

In the *Archives of Internal Medicine* of May 15, 1915, COLEMAN and DU BOIS tell us that the heat production of typhoid patients has been measured by the methods of direct and indirect calorimetry in a series of sixty-one experiments. The two methods agreed closely, the total divergence being 2.2 per cent, and the average divergence in the individual experiments being 5 per cent. This and the entire absence of abnormal respiratory quotients indicate that in typhoid fever protein, fat and carbohydrate are oxidized to the same or approximately the same end products as in health, and in their oxidation give off the standard amounts of heat. Therefore the law of the conservation of energy applies to fever patients.

The rectal temperature does not always give an accurate indication of the average change in body temperature, and better results are often obtained by well-covered surface thermometers.

The basal heat production rises and falls in a curve roughly parallel with the temperature. At the height of the fever it averages about 40 per cent above the normal, but in some cases rises to more than 50 per cent above the normal.

The specific dynamic action of protein and carbohydrate is much smaller in the febrile period of typhoid than in health, and in some cases seems to be absent. In convalescence it may be greater than normal.

In a majority of cases a rise in temperature is accompanied by an increasing heat production and an increasing heat elimination.

Typhoid patients can store body fat on an abundant diet while losing body weight and body protein. Loss in weight and loss of protein are usually though not necessarily parallel.

There is a toxic destruction of protein in typhoid fever. This is shown by the fact that patients have a distinctly negative nitrogen balance on a diet which contains more than enough calories to cover the heat production.

THE OCULOCARDIAC REFLEX.

In the *Archives of Internal Medicine* of May 15, 1915, is discussed, by LEVINE, this interesting theme. He concludes as follows:

1. Ocular pressure affords a simple and safe method of obtaining reflex vagus inhibition of the heart.

2. Inhibition of the heart by the oculocardiac reflex is much more profound and more frequently obtained than by pressure over the vagus nerve.

3. The oculocardiac reflex is generally absent in tabes dorsalis, present in pneumonia, syphilis (non-tabetic), and chronic valvular disease.

4. The reflex was absent in one case of diabetes mellitus and also in one case of auricular fibrillation before digitalis treatment. It was present after digitalis was given.

5. Right ocular pressure has a slightly greater effect on the rate of the heart than left. It may stop the heart for a long period of time, relatively speaking; the P-waves are sometimes diminished in size and may become iso-electric. Occasionally the auriculoventricular interval is lengthened.

6. Left ocular pressure has a much greater effect on the conduction mechanism of the heart than right. It may lengthen auriculoventricular conduction, cause partial heart-block, and result, possibly, in automatic ventricular rhythm. On two occasions inverted P-waves were seen. The height of the R-waves is sometimes increased, at other times diminished. Ectopic ventricular beats were twice observed. The P-waves are often diminished in size, but occasionally are increased. Escaped ventricular beats were seen both during right and left ocular pressure.

7. Pain, flushing of the face, and apnea during ocular pressure, are much less pronounced in tabetics than in non-tabetics.

8. The effects on the rate and on the rhythm of the heart produced by ocular pressures are not constant, differing in different individuals and in the same individual from time to time. The duration and the degree of pressure play an important part in the degree of inhibition.

DIURNAL VARIATIONS IN ARTERIAL BLOOD-PRESSURE.

In the *American Journal of Physiology* of May 1, 1915, WEYSEE and LUTZ report a long research and reach the following conclusions, which are of clinical value:

1. A rise of maximum pressure averaging 8 mm. Hg occurs immediately on the ingestion of food. A gradual fall then takes place until the beginning of the next meal. There is also a slight general rise of the maximum pressure during the day.

2. The average maximum blood-pressure for healthy young men in the neighborhood of twenty years of age is 120 mm. Hg. This pressure obtains commonly one hour after meals. The higher maximum pressure occurs immediately after meals, and the lower, as a rule, immediately before meals.

3. The range of maximum pressure varies considerably in different individuals, but the highest and lowest maximum pressures are practically equidistant from the average pressure of any one individual.

4. The minimum blood-pressure is very uniform throughout the day, and is little affected by the ingestion and digestion of meals. When it is affected a rise or fall may take place. There is a tendency for a slight general lowering of the minimum pressure throughout the day.

5. The average minimum blood-pressure

for healthy young men in the neighborhood of twenty years of age is 85 mm. Hg. Thus we get an average pulse-pressure of 35 mm. Hg.

6. Pulse-pressure, pulse-rate, and the relative velocity of the blood flow are increased immediately upon the ingestion of meals. They attain the maximum, as a rule, in half an hour, and then decline slowly until the next meal. There is a general increase in each throughout the day.

7. The average pulse-rate in these investigations proved to be 72 beats per minute.

THE TREATMENT OF PYORRHEA ALVEOLARIS, WITH SPECIAL REFERENCE TO EMETINE.

The *Journal-Record of Medicine* for April, 1915, contains an article by ADAIR on this timely subject. He says that it seems to be necessary to recall to the minds of medical men that the dental profession has for years been curing pyorrhea, and that this has been accomplished by performing the proper surgical work; only after these procedures have we cured pyorrhea, and then without regard to amebæ. The method used was to remove the coat of bacteria, and then when the tissues were given proper stimulation, the patient has been cured of pyorrhea.

Can any one look at the dead peridental membrane on an extracted pyorrhea tooth; can any one look at the skull of a dead person who had pyorrhea and see the bone destruction there; can any one after seeing these sights say that he believes the application of any drug could remove the cause of pyorrhea and cure it? He does not underestimate the importance of amebæ in pyorrhea cases, but discredits the reports of the marvelous cures from the use of ipecac only.

Does it have any bearing on the facts in the case to say that a man having amebic colitis was given one hundred and sixty grains of ipecac without any sign of improvement of the diseased mouth? Does it have any bearing on the case to say that within one month after this, when his mouth had been cleaned up, the disease was eradicated?

Does it have any bearing on the case to state that when the writer has a splinter in his finger it suppurates, then he might by the injection of emetine arrest the suppuration for a few hours; if he should still leave the splinter in the finger, a relapse would occur? This is the same relapse often spoken of by the investigators who treat pyorrhea by emetine. The cause is still there in both cases and must be removed before a permanent cure can be effected.

The writer has used emetine, is using it, and will continue to use it, but it is on thorough surgical work that he depends for his cures. In reading the various advertisements of the pharmaceutical houses not only of emetine, but for other drugs also, he has been struck with the emphasis which has been put on the statement that they are absolute cures without any surgical help.

Read the recent papers by Dr. Bass and compare his claims and findings with a paper read before the New York Pathological Society, 1907, by Dr. L. T. LeWald, in which he showed amebæ could be demonstrated in the mouth almost constantly, no matter how much care was taken of the teeth.

The Bureau of Laboratories of the New York Health Department will next month publish their report on "Amebæ in the Mouths of Schoolchildren." If Dr. Bass's claims are true, then all schoolchildren have pyorrhea. Such a claim is absurd on the face of it.

Does it have any effect on the status of ipecac treatment when we read that Drs. Merritt, Hartzell, Talbot, West, McCall, and other distinguished investigators in the field of pyorrhea could not verify the results claimed for this treatment?

A distinguished medical investigator, Rosenberger of Jefferson Medical College, chair of bacteriology, writes as follows: "The ameba buccalis plays very little if any part in the etiology of pyorrhea. . . . My own results with emetine have been very poor."

Rosenow, of Chicago, writes Adair under recent date that "the work of Bass and Barrett in the use of emetine in the treatment of pyorrhea is very interesting, but I fear that they have not sufficiently emphasized the need of proper dentistry in the way of removal of tartar, deposits, etc., for the permanent relief."

The greatest mistake made is that every individual has pyorrhea, just because he believes the amebæ are the cause of pyorrhea, and he finds that in all mouths. Dirty, filthy mouths have the largest number of these parasites, and it is a strange fact that just such a mouth may be free from pyorrhea. On the other hand, pyorrhea may be present in a well-kept mouth. Pyorrhea alveolaris is an affection of the peridental membrane of the tooth with the formation of tartar and the molecular death of the alveolar process as its last stage. The most severe cases may not have any pus pockets.

Many physicians have of late been giving their patients emetine by the hypodermic method without a proper diagnosis of pyorrhea. Some have come into the writer's office with both arms so sore they could not do their ordinary duties. Some of these had no pyorrhea. The writer has seen ulcerations of the mucous membrane of the mouth due to the physician prescribing ipecac as a mouth-wash. The writer urges physicians to examine and diagnose pyorrhea, but believes the coöperation of a dentist in the treatment will result in more good for the patient.

It is the writer's custom to make a physical examination, the record of which is kept in a special book. A comparative table of the temperature, blood-pressure, urinalysis, taken before and after treatment, proves the ultimate association with other diseases.

The writer generally finds that the patient has faulty elimination or indicanuria, and does not eat the proper food. If he finds any systemic disease, he refers patients to a competent physician to coöperate with him in restoring the patient to health.

The proper surgical work for pyorrhea is most exacting, and requires much skill. Regardless of the claims of Barrett, Bass, and others, the most successful cure of pyorrhea is dependent entirely upon the thoroughness with which this work is done.

The field is sterilized, the roots of the teeth planed, and the pockets curetted. The writer always endeavors to leave in the pocket a fresh blood-clot which he protects until it becomes new structure.

When the teeth become comparatively firm, and the mouth is in a sanitary condition, the patient is taught the proper care of the teeth. If this instruction is carried out by the patient, he should be able to keep his mouth in a sanitary condition.

A STUDY OF SCOPOLAMINE AND MORPHINE AMNESIA.

In the *American Journal of Obstetrics* for May, 1915, Polak points out that it is claimed by the critics of this method that the child is apt to be asphyxiated and narcotized. He asserts that this is not the fault of the method, but the fault of the dosage, and of the individual using it. The child does participate in the twilight sleep to some extent and may suffer from oligopnea for several minutes, and it is common for the cry to be delayed for a minute or two after birth, though the fetal heart may show no disturbance in either rate or rhythm. Cyanosis, however, is the exception, unless the dosage has been too large, or given at too frequent intervals, or too late in the labor, or the second stage has been allowed to continue too long. We can see no reason why, because scopolamine has been given, that the ordinary obstetric rules as to the management of the second stage should be disregarded. Yet this has been the fact in many of the reported cases. The child, after stretching itself as if awakening from a restful sleep, cries as lustily as the ordinary new-born infant, if the method has been employed with the same intelligence that would be given to the use of an anesthetic in the second stage of labor. The writer's experience convinces him that the induction of twilight sleep is

distinctly a first-stage procedure and should not be begun if the labor is too far advanced. His own experience, as well as the collected statistics of Dr. Beach, shows that the actual fetal mortality is lessened by the employment of this form of anesthesia.

Contrary to the popular idea of twilight sleep which is advanced by those women who have had successful deliveries here and abroad under its influence, the writer wishes to impress upon us that its employment has distinct limitations in abnormal cases, and must be used with judgment in all. It is particularly indicated in nervous women of the physically unfit type in their first labor, for it is in this type of women in ordinary practice that labor has most often to be terminated artificially, owing to the physical exhaustion so common at the end of the first stage, before cervical dilatation is complete, or in the second stage when no more muscular force can be brought upon the uterus by the undeveloped abdominal muscles. The usual obstetric interference by forceps in unprepared soft parts results in a permanent morbidity, and is the largest contributor to our collection of chronic invalids. It is in this class, the physically unfit, that scopolamine will give the best results, for by its use we are able to obtain full dilatation of the cervix by operation of the normal physiological factors, namely, the bag of waters and the force of the uterine contractions before the patient begins to show signs of physical tire. In dry labors the exquisite pain which is produced by pressure of the presenting part on the congested, sensitive cervix is relieved by the administration of scopolamine and morphine, and the cervical ring is relaxed. Consequently the presenting part is driven through the pelvis and later into the vagina, and low forceps in dilated passages is the most serious intervention to which the woman is subjected. This statement is proven by the marked diminution in the number of high and medium forceps instituted when twilight sleep has been used.

Border-line disproportions also offer another indication for its use, for all primiparæ with border-line contractions should be given a test of labor before instituting operative measures. This means that the cervix must be dilated, the membranes ruptured, and the uterine contractions aided by a tight binder and proper posture, and the patient be given a chance to drive the presenting part into the pelvis. This all takes time and effective labor pains, and these patients are in need of rest between contractions, because having pain is work, and work exhausts. Under scopolamine amnesia and analgesia this same woman may be carried for hours without showing any of the classical signs of exhaustion, in the character of the pulse and its rate, or in the character of the labor pains, and if operative delivery is indicated, either in the interests of the mother or child, it may be accomplished with less shock and with less general anesthesia.

The conduct of labor in cardiac cases is favorably influenced by the use of twilight sleep. Apprehension, restlessness, and physical pain are all ameliorated by the scopolamine, hence the strain of labor, which plays such havoc in hearts which are decompensated, may be greatly reduced by carrying the woman through the first stage of labor under twilight. In the writer's service at the Long Island Hospital he has employed morphine and scopolamine as a routine in his cardiac cases, whether compensated or decompensated, and by this plan has fortified the woman's resources and obtained full dilatation of the cervix without putting strain upon the heart. The same may be said upon the conduct of labor in the presence of tuberculosis, where the first stage may be successfully carried through under twilight sleep.

The contraindications to its use are the emergency conditions which arise in obstetric practice, as precipitate labor, placenta previa, accidental hemorrhage, eclampsia, prolapse of the cord, primary inertia, and a dead fetus. On the other hand, it may be used as a first-stage procedure to secure dilatation in malpositions, when such malposition is recognized, as it has been shown that the proper employment of scopolamine favors dilatation of the cervix and diminishes the spasticity of the uterus.

Two methods of administration have been introduced into this country: that of Siegel, who uses the drugs according to a definite schedule of doses, a method employed in third-class patients in Freiburg with fair results, and that of Gauss, who individualizes the patient, grading the doses by the condition of amnesia obtained. In this plan a single dose of morphine hydrochloride is given instead of repeated doses. Until the writer adopted the latter method, many of the babies showed some cyanosis.

The drugs as used at Freiburg come in ampoules, each containing 1 Cc. of the solution, the strength of which is as follows: Each ampoule contains respectively scopolamine hydrobromide (Straub) 0.0003 gramme (gr. 1/200), solution of narkophen 0.03 gramme. According to the Siegel method they are administered as follows: When labor is definitely established, 1½ ampoules of each drug is given hypodermically as the initial dose; forty-five minutes later 1 ampoule of scopolamine is administered alone; while one hour later ½ ampoule of each is given. The amnesia is maintained by repeating the scopolamine alone in ½-ampoule doses every two hours. It is seldom necessary to repeat the morphine solution, though it may be used every third time, at six-hour intervals, in a long labor. It is the morphine which has the effect on the child.

In the Gauss method an initial dose of morphine hydrochloride ⅛ to 1/6 grain, with scopolamine hydrobromide (Straub) 1/200 grain, is used; the morphine is not repeated, but the scopolamine in doses of 1/200 grain or 1/400 grain is given at one-, two-, or four-hour intervals, depending on the degree of amnesia and the clinical picture presented by the patient. Each woman is individualized and carried along with the minimum dose. Smaller doses are required when the sleep is induced early in labor, large doses when the first stage is well advanced before the initial dose is administered. It is in the latter class that there is most danger to the child, as the child gets the full effect of the drug. [The Gauss method would seem the best.—Ed.]

THE MEDICAL TREATMENT OF PEPTIC ULCER, WITH ESPECIAL REFERENCE TO THE LENHARTZ TREATMENT.

The *Bulletin of the Johns Hopkins Hospital* for May, 1915, contains an article by Blumer on this subject.

The writer's experience with the Lenhartz diet covers 27 cases treated by that diet with unessential modifications. He feels that while the number of patients treated is too small to allow him to draw any statistical conclusions of value, it is allowable to record certain definite impressions which he has received. In general, it may be said that the Lenhartz diet is, as a rule, eminently satisfactory from the patient's point of view. The pain accompanying the disease usually disappears within a few days, and the writer can substantiate the claim of Lenhartz that narcotics are seldom necessary. The patients seldom complain spontaneously of hunger, though when questioned they sometimes admit its presence. Most patients lose weight during the first week or ten days, but many of them regain it before the cure is ended, and some considerably surpass their weight on entrance, when discharged. In patients followed after discharge, great gains in weight are sometimes noted, as much as 30 pounds in one patient.

In none of the published statistics can the writer find any distinction between gastric and duodenal ulcers as regards the efficacy of the Lenhartz cure. Thirteen of his patients were suffering from the symptoms of duodenal rather than gastric ulcer, and 10 of these were entirely free from symptoms or signs of the disease at the end of the treatment. All were benefited, there being no absolute failures. Five of them have remained well over a year and a half. In only one of those apparently cured has he a report of a relapse, and this occurred after eight months. This is a decidedly better record than is shown by his 14 gastric cases, two of which were absolutely unbenefited, one of them after two treatments, and four of which relapsed, three after short periods. While it is hazardous to draw conclusions from such small num-

bers of patients, the writer cannot help feeling that patients with gastric ulcer do less well on the Lenhartz diet than those with duodenal ulcers, and that this is due to the element of stasis being much more prominent in certain stomach ulcers, even when actual pyloric stenosis is absent.

The writer's experience with the Lenhartz diet also allows him to substantiate some of the objections made to it. In several instances patients were unable to tolerate the raw egg diet, even when the eggs and milk were mixed. In some instances this was due to the fact that cold storage eggs were the only ones available at the time, rather than to any intrinsic objection to the egg as an article of food. This is, nevertheless, a real objection in patients with sensitive palates. In one or two instances the milk in the diet disagreed and had to be discontinued. In both the case of the eggs and that of the milk the disagreement took the form of vomiting, often accompanied with a temporary return of pain. The raw meat of the original diet the writer did not employ, but substituted minced chicken, as suggested by Lambert. American observers, Gilbride for example, have noticed that the American stomach is intolerant to the raw meat and ham of the original Lenhartz regimen. The writer has on two occasions noted a return of hemorrhage during treatment, though this was not serious. He would also point out that a gain in weight is by no means always to be expected, and that while pain usually disappears early, tenderness remains much longer and is often present well along in the cure.

A critical study of the literature of the medical treatment of peptic ulcer, particularly the rest and diet cures, suggests certain conclusions. It seems safe to assume that certain types of peptic ulcer show a strong natural tendency to heal if given a fair chance. Ulcers near the pylorus tend to heal badly, while bleeding ulcers, for reasons not entirely clear, seem to heal unusually well. Many ulcers would doubtless heal on the all-important complete rest, plus any of the dietary regimens that have been discussed. Others would equally certainly fail to heal under any form of medical treatment. Originators of diets are apt to adhere too closely to those diets, and tend to become prejudiced against different but equally efficacious ones. The practitioner, whose sole purpose is to cure his patients, and who need not be distracted from this by attempts to glorify the products of his own cortical cells, should realize that there are good points in all of the diets presented. Each has its advantages and each its drawbacks, and the wise physician is he who will use them as frameworks to be clothed with a dietary structure suitable to the needs of each individual patient.

BENZOL IN LEUKEMIA.

In the *Journal of the American Medical Association* of May 22, 1915, F. H. SMITH asserts that there is still no proof that benzol is specific. Of one thing he feels certain: it has not cured, and it will not cure in his case. One may doubt whether such dogmatism is ever proper. Suppose the dose was raised? The writer believes that benzol poisoning would follow, nor is there reason to believe the case would be any nearer a cure for the risk. There is not the constant decrease of the size of the spleen, nor the constant falling off, to disappearance, of the myelocytes that would be expected were the drug's specificity dependent on a higher dose (25 drops t. i. d.) than any the writer has ventured.

In doubting its specific properties the writer admits a great disappointment. He had hoped that one more of the number of incurable diseases was soon to give way before specific therapy. Instead of this hope, he is confidently looking forward to the time when in spite of, if not because of, benzol his patient's leukemia will assume one of three forms: a chronic progression upward of the leucocyte curve, a constant enlargement of the spleen, and ultimate death, just as if there had been no staying treatment; or an acute fulminant picture, in which the increase of the leucocytes will be by leaps and bounds to a high figure; or, on the other hand, a drop in the leucocyte

curve will come, will not stop at the normal line, but will continue downward to 500 or thereabouts, with all the other evidences of aplastic anemia.

When all is said, however, concerning the disappointment in train of his experience, and of the dangers that lurk in its unguarded and largely empirical use, this chemical has a most remarkable inhibiting influence on the course of the disease. There is no exact analogy that the writer can think of. Like digitalis, however, benzol may have a distinct place in therapy, even if its action proves short of specific, and merely symptomatic, staying, or inhibitory.

"TWILIGHT SLEEP."

In the *American Journal of Obstetrics* for May, 1915, BEACH from his study of the "Dämmerschlaf" states that he thinks we may draw the following conclusions:

First. That "twilight sleep" is a reality and not a fad.

Second. That by its application we may give about 85 per cent of cases in which it is used a practically painless labor.

Third. That it is contraindicated in certain definite cases, especially in primary uterine inertia, markedly contracted pelvis, and the emergencies of labor which demand operative interference.

Fourth. That it may be used in all other labors and is especially applicable to the nervous woman, the physically unfit woman, in the long painful first-stage labors, in cardiac cases, etc.

Fifth. That the women after twilight labors are in better condition because there are less difficult forceps, less lacerations of the cervix and perineum, better milk secretion, and less nerve exhaustion. They recuperate much faster than by the old method.

Sixth. That it does not cause insanity, as stated in the lay press, but rather tends to diminish its occurrence.

Seventh. That we will have more and better babies.

Eighth. That its disadvantages are slight, and we are learning to overcome them by further knowledge of the method, a closer attention to detail and perfection of technique.

Lastly. That "twilight sleep" is a method which, to get the best results, must be performed under ideal surroundings, with the minimum possible dosage and by some one who has trained himself to do the work.

Beach does not claim that "twilight sleep" will be a panacea for all women in labor as the treatment is essentially a hospital one, except among the wealthy who can afford the assistants necessary.

The great bulk of people of the middle class will still be delivered at their homes by the family physician. However, under the proper surroundings and given intelligently, "twilight sleep" is a scientific reality and will become more and more used as a part of the armamentarium of the expert obstetrician.

THE TREATMENT OF PRURITUS ANI.

In *American Medicine* for April, 1915, DRUECK says the treatment of pruritus ani divides itself into cleanliness, keeping the parts dry, maintaining rest by preventing friction between the sides, and relieving sphincteric spasm. Scrupulous cleanliness during the local toilet is imperative. The matter of toilet papers is important. Adler calls attention to the fact that harsh papers and ordinary newspapers, because of the printer's ink, often cause a pruritus. A patient, whom the writer attended, presented a very obstinate case of pruritus that persistently recurred, until it was discovered that the sufferer used as toilet paper the tissue-paper which had been wrapped around oranges and lemons. When this practice was stopped and a little local treatment given, the trouble disappeared and has never recurred. Where contact of the feces produces pruritus, the ordinary use of toilet paper is not sufficient to remove all of the small particles, and pledgets of cotton moistened in warm water are much more efficient. The addition of sodium borate or bicarbonate to the water used in washing is often of value.

In conjunction with the local applications

to be described later the writer has made it an almost routine practice, whether the cause is evident or not, to gradually but thoroughly dilate the sphincter. There is always present a hypersensitiveness of the anal mucous membrane or a hypertrophy of the sphincter muscle, both of which conditions are relieved by this procedure. The dilatation is performed slowly and without an anesthetic. By frequent moderate stretchings he overcomes the hyperesthesia and abnormal resistance and in that way relieves the constipation that occurs from prolonged retention of the feces. This also relieves the tenesmus that is set up and which keeps the skin under tension and helps to make defecation painful. It has been advised to perform the dilatation under chloroform, but the writer does not employ that method, because whenever one dilates forcibly there is danger of incontinence resulting, which will be more or less permanent. This mishap is never possible when the dilatation is performed by his method.

The local application of astringents and ointments, as acetate of lead or zinc, zinc oxide, carbolic acid, chloroform (a drachm to the ounce of olive oil), bismuth or mercury may be tried, but with varying success unless the predisposing cause is removed. Opium is to be used very advisedly because of the possibility of inducing the habit and because the secondary effect of the drug is to produce a general itching. The writer has found mutton suet and diachylon ointment preferable to other emollients. The following formula he has frequently used to give temporary relief while treating the underlying cause:

> Camphoræ,
> Chloral hydratis, ää drachm j;
> Ung. diachylon, ounce j.

This may be applied two or three times daily after bathing the parts.

Much immediate relief is obtained by brushing the surface with nitrate of silver, twenty grains to the ounce, or with Churchill's tincture of iodine, twice a week. Both applications produce some temporary pain, but the relief afterward fully compensates for the suffering.

When the pruritus is due to threadworms, injections of lime-water or salt water are sufficient, or, in severe cases, an anthelmintic, as santonin. Occasionally this procedure needs to be repeated. When due to vaginal discharges douches of 1-to-2000 mercuric chloride or two-per-cent lysol should be used daily. In infants, when due to lack of attention during an attack of diarrhea or to fermentation of urine about the parts, the writer has found picric acid, ten per cent, in diluted nitrate of mercury ointment, gives the best results.

Eczema in all its various forms is frequently a cause. If the skin is dry and scaly much benefit is derived from tar preparations. Bathe the parts with a solution of alcohol and tar water, or use an ointment, as:

> Picis liquidæ, drachms iv;
> Ung. belladonnæ, drachms ij;
> Acid. carbolici, m. x;
> Adeps lanæ, drachms ij.

Bathe the parts repeatedly in water as hot as can be borne and in green soap, to remove the thickening scales and to deplete the local circulation. In exaggerated cases, a solution of caustic potash, five grains to the ounce, may be used. A cloth may be used to sop the hot water on the parts, but do not allow any rubbing. This treatment on retiring will often insure a restful sleep for an otherwise tortured patient.

In the moist variety of eczema and in erythema, soothing applications such as calomel, bismuth, boric acid, starch, or zinc oxide powders may be dusted on the parts and a piece of lint or muslin inserted between the buttocks. The following, as an ointment, has acted admirably in many of these cases:

> Thymol, grs. ij;
> Pulv. zinc stearatis, drachms iv.

When the patient is about to indulge in excessive exercise, work or walking, especially an obese subject, where he is likely to aggravate the condition, he should apply the above ointment before the effort and bathe the parts promptly afterward with cold water, being careful to dry the parts thoroughly. Frequent ablutions of cold

water give much temporary relief in these cases. For fleshy individuals and others who perspire freely and are liable to chafe, carbolic acid solution ½ per cent, or potassium permanganate 1 to 5000, is an admirable lotion to be used daily with the toilet.

In eczema marginata, bathe the parts thoroughly with warm water and soap, dry carefully with a soft cloth, and then apply dilute sulphuric acid. It is painful for a short while, but gives immediate relief. Tincture of iodine may be used. In purely neurasthenic cases, local treatment is of no use and the patient is better off without it. Moral and hygienic instruction is much more needed, and in some instances straight talk, as Morris calls it, will do more than all the drugs. In severe cases or when the pruritus is due to disease of the brain, spinal cord, or their membranes, it may be necessary to give the patient a narcotic to enable him to sleep. Succus conii (B. P.) one drachm given three times daily is efficacious. Bromide or chloral is preferable to opium, as the latter causes more itching the next day.

Recently the Roentgen rays have been used in the treatment of pruritus and eczema about these parts, but the work in many instances has been done by enthusiasts and its value overestimated. Very often, but not always, the *x*-ray acts almost magically, but there is always the danger of possible burns even in the hands of an expert, and this danger is increased if the treatment is continued over a long period of time. It has also been found that azoöspermia may be induced unless the Roentgen ray is used very guardedly to limit the action of the light to the skin only. A fifteen-minute treatment every other day for two weeks ought to show results by relieving the itching and by increasing the discoloration of the skin. A tube of low vacuum is held about ten inches from the patient. The surrounding parts are to be protected by lead sheet, and no application or ointment containing metallic salts is to be used at any time during this treatment. Nothing is worse than the empirical use of any agent, and it is folly to use the *x*-ray on every case, without first finding the cause of the itching. The *x*-ray will prove a valuable assistant, however, if its use is limited to cases of unknown origin or those that prove themselves especially obstinate, and in which relief alone is desired. A cure cannot be expected even with the use of the *x*-ray, unless the cause is removed. Should a cure occur, it will be only temporary if the excitement causing it is allowed to remain.

When the pruritus is due to proctitis, hemorrhoids, fissure, ulceration, fistula, prolapse, or polypus, and the patient refuses to submit to surgical treatment, or in senile, debilitated or hemorrhagic subjects, much relief may be given by the use of the following:

> Calomel, gr. xxx;
> Menthol, gr. x to xx;
> Vaselin, oz. 1.
>
> Sig.: Apply after each bowel movement, bathing the surface carefully before and sopping it dry.

If there is much pain, cocaine hydrochloride, 10 grains, may be substituted (Mathews). The use of unguentum gallæ or tincture of iodine will relieve the itching when hemorrhoids are the cause. These formulæ have given the writer much satisfaction in a general way, but must be altered to suit each case. Finally, there remains a class of cases in which the pruritus persists in spite of all therapeutic treatment and in which there is no apparent cause, either local or systemic. In these instances the actual cautery applied lightly all over the irritated surface will at times effect a cure.

BELL'S PALSY AND NEURITIS OF THE EIGHTH AND TWELFTH NERVES FOLLOWING SALVARSAN INJECTION.

In the *Interstate Medical Journal* for May, 1915, DABNEY reports on this topic. He says that foreign observers and syphilographers have reported numerous deaths and very many cases of neuritis following the administration of Ehrlich's synthetical arsenical preparation for the treatment of lues, but such commendable frankness and

conscientious conduct has not been common with us, whatever be the motives. Consequently, the utter abandon with which many practitioners, regardless of their training or special knowledge, proceed to give this powerful mineral poison has not been halted by the fear of evil results, since practically none are laid before them. The wide publicity given salvarsan as a remedy, when it was first introduced to the profession, and the erroneous interpretation of Ehrlich's claims seem more responsible than any one cause, always saving the lack of investigation on the part of the users.

That salvarsan is dangerous and is not a cure for syphilis has not been long recognized in this country by the men of our profession who are not in touch with the more populous centers of medical training. Moreover, it has not supplanted mercury in any way. In fact, it seems to be the feeling among all thoughtful users of this remedy that its danger is greatly lessened by a preliminary course of mercury. Certainly the nerve lesions, such as those with which this paper is concerned, would be materially lessened in number and occurrence.

While the case cited by Dabney cannot be viewed as an evidence of the Herxheimer reaction, yet the writer thinks that the palsy is an arsenic neuritis and that the pressure palsy is superinduced by the salvarsan being thrown into the blood current in the presence of syphilis hitherto untreated, or unprepared, as it were, for the powerful attack of the arsenic. A quotation from the work of Captain H. J. Nichols of the army, to be given later, however, would seem to destroy the writer's theory, but the difference is not real, though his opinion is not to be lightly brushed aside.

The history given by this patient is so vague as to dates that much must be added or inferred, such as the sequence of the palsy, which he later said might have occurred earlier than two weeks, or even ten days, after injection. On this point hangs the writer's belief that this is the result of the tremendous reaction of the salvarsan on the syphilitic deposits in the nerves involved, which would be especially powerful, as he had no mercury to mitigate the severity. However, it is but fair to show that the writer may be wrong; so he quotes Captain Nichols, an admitted authority: "The occurrence of nervous relapses was an unexpected complication of salvarsan therapy in syphilis and for a time threatened seriously to interfere with its progress. . . . They occur in salvarsan treatment only in the early secondary period and only some time after the treatment has been stopped." The writer's case may be considered as being in the early secondary period, but it could not be said that the nervous phenomena, occurring some time after treatment, had been stopped; thus far, accordingly, his supposition that the salvarsan and not the syphilis was causative seems fairly well supported. "On the other hand," continues Nichols, "if this case can be given one or two doses of salvarsan and no other treatment, the bulk of spirochætæ in the body are suddenly destroyed, and the symptoms and Wassermann reaction disappear. All the spirochætæ are not killed, however; some survive, either because they are inaccessible or resistant, and in a short time they begin to multiply, and they meet no resistance such as is afforded by mercury or by the resistance of the body, which has not been stimulated continuously by the parasites. As a consequence the organisms multiply locally to an enormous extent and produce a sudden, explosive relapse. The effect of the relapse is most evident in the most sensitive tissues—that is, the nervous tissues—and here we see such results as deafness, blindness, paralysis of the face or hemiplegia, or a psychosis." So far from disproving the writer's theory, this lucid, reasonable explanation of the true nervous relapse in syphilis rather strengthens it, as it shows that an appreciable interval must elapse after the cessation of the salvarsan in order that the luetic toxin may reassert itself. Certainly a full dose of this remedy would hold it in abeyance for as long as ten days, or even twenty-one; moreover, if it were a Herxheimer reaction, it would occur inside thirty-six hours. Thus it seems that the nerve affections in this case were due neither to the syphilis itself nor to the in-

creased reaction known by the name of "Herxheimer"; consequently it is fair to assume them to have been the result of an arsenic neuritis, which is one of the long-recognized effects in the use of this drug.

The lesson to be learned from this case, whatever be the conclusion as to etiology, is obvious and valuable: Salvarsan is not to be used without training, without previous mercury treatment, or without that eternal vigilance which we have all been admonished to regard as the price of safety.

USE AND ABUSE OF THE FORCEPS.

PHILLIPS in the *New Orleans Medical and Surgical Journal* for May, 1915, claims that the chief abuses of forceps are in the high application; that is, when the head is at or above the brim or inlet of the pelvis. Harrar, in the *American Journal of Obstetrics,* 1913, gives the fetal mortality in this condition as seventeen to twenty-six per cent. Aside from the mortality, we have the morbidity to consider, which is certainly very discouraging. Of all injuries to the child the high forceps will give the most extensive and numerous, including intracranial hemorrhages, compression and concussion of the brain, fracture of the skull, and numerous nerve injuries resulting in temporary or permanent paralysis. As for the mother, the injuries resulting from this condition are very serious, such as extensive lacerations of anterior and posterior walls of the vagina and the cervix, and often rupture of the uterus. As the high application is frequently associated with an incomplete dilatation of the cervix, the injury here is extensive, and very hard to cure; the tear often extends into the broad ligament or the lower uterine segment, and the amount of scar tissue formed during the healing process is hard to remove and is frequently the cause of much pain. Besides the danger of infection in this condition, the possibility of profuse hemorrhage is also always present. One of the principal exceptions that the writer might mention in condemning high forceps is in dry labor in a normal pelvis with the head engaged at the brim of the pelvis and the cervix completely dilated; even in this condition, if the position were normal the writer would employ forceps only as a last resort and after pituitrin and other more simple methods had failed.

The second and equally as great abuse of forceps is in cases of contracted pelvis; in the extreme cases the condition is so marked that even pelvimetry is not essential to make a diagnosis, and the case is at once determined a suitable one for Cæsarian section; but it is in the milder degrees of contraction, the so-called border-line cases (where the conjugate vera measures 9 or 9½ cm.) that the abuse is so marked. Watson, in the *Canada Lancet,* 1914, says that in border-line cases in which, with the pelvis normal in size or slightly contracted, there is a disproportion between the fetal head and pelvic brim, and the head has failed to engage at the beginning of the second stage, immediate application of forceps will result in the death of the fetus in 25 per cent of cases, and there will be a maternal mortality of 1 to 5 per cent and a high morbidity. If the labor be allowed to continue without interference spontaneous delivery will occur in 75 to 80 per cent of cases, with a fetal mortality of 1 to 2 per cent. Cæsarian section performed before any attempt has been made to deliver with forceps should give a negative fetal mortality and a maternal mortality of 2 to 3 per cent, and finally the performance of the operation after one tentative application of instruments, providing asepsis has been observed, will give almost equally as good results. Should an attempt be made to use forceps in this condition, traction must be slight, as any case requiring more than the ordinary amount of force obtained from contraction of biceps muscle is not a case for forceps. In suspicious cases estimation of the relative size of the fetal head and maternal pelvis, as advocated by Kerr and Mueller, will assist very much in determining the possibility of spontaneous or safe forceps delivery; failure to cause the head to engage will usually indicate Cæsarian section.

Practical Indications for Use of Forceps.—Probably the condition most often calling

for forceps is uterine inertia, frequently associated with resistant perineum in primiparæ, most often elderly primiparæ. Artificial rupture of membranes, or use of pituitrin, will sometimes remove indications for forceps in these cases. Should this fail and the head remain on the perineum for a period of two hours or more, with slight progress, even though the pains be fairly strong, the writer thinks the labor should by all means be terminated with forceps.

Another condition often necessitating the use of forceps is in occipitoposterior positions of vertex presentations with incomplete rotation and the small fontanelle directed toward the mother's sacroiliac synchondrosis; this represents a class of cases in which forceps are most often necessary, and even though the diagnosis has not been previously made, a prolonged second-stage labor with strong contraction of uterus and slow progress should always cause one to think of occipitoposterior positions, especially if there has been a premature rupture of membranes, which is so often associated with this position. The fetal heart as a guide is also a good indication for the use of forceps; should the rate exceed 160 per minute or drop below 100 per minute, the labor should at once be ended; severe convulsive movements on the part of the child are likewise significant of lack of normal supply of oxygen and mean that an early termination of labor is necessary for the welfare of the child.

THE THYMUS AND THE PITUITARY IN DEMENTIA PRAECOX.

In the *American Journal of Insanity* for April, 1915, LUDLUM and CORSON-WHITE write on this topic.

A résumé of this paper, which is offered as a preliminary report on this method of study, is:

1. In a group of cases of dementia praecox, Abderhalden reactions were obtained in some instances to testicle and pancreas; in others, to testicle and thyroid; while in still others no reaction could be secured.

2. In the individuals that gave the reactions to testicle and pancreas, there were observed physiological symptoms of the same type as those found in animals from which the thymus had been removed.

3. In examining the blood of animals whose thymus had been removed, the same reactions were obtained as in the case of a certain group of patients, indicating that in this group there exists a disease entity.

4. With regard to the pituitary, there were a considerable number of cases with the symptoms of dyspituitarism that improved with pituitary extract. There were also a group of cases of hyperpituitarism that improved with the opposite organic extract, which is the Brown-Séquard fluid.

THE TREATMENT OF ACUTE SUPPURATIVE OTITIS MEDIA IN INFANTS AND CHILDREN.

CHARLTON, of Atlantic City, in discussing this subject in the *Journal of the Medical Society of New Jersey* for May, 1915, points out that some of the most frequent causes are catarrh, adenoid vegetations, tonsillitis, bronchitis, and pneumonia. Many babies with acute otitis media apparently show few symptoms. In these cases the only way to establish a positive diagnosis is by observation of the drum membrane. Should the drum show a hyperemia at the handle of the malleus, injection of the vessels, pale and yellow discoloration with bulging, a paracentesis should be performed. Oftentimes children will begin by being restless, irritable, with poor appetites, sensitive around the head and holding their hands to it. In some of these cases disturbance of the intestines is observed before the symptoms of the middle-ear disease. In healthy babies the symptoms, generally, come on suddenly with a cry, restlessness, tremor, and rise in temperature to about 102° to 105° Fahrenheit. The child is often noticed rubbing the ears or side of the head. If only one ear is involved the child generally rests more quietly when laid on the affected side. The pain is most often paroxysmal and grows worse at night, but if free perspiration is established this pain is often relieved. The writer wants to emphasize

that every baby that has a rise of temperature should have an examination of the ears and throat.

In the writer's hands the best result from treatment has occurred where peroxide of hydrogen was instilled into the canal before and during irrigation. Do not be afraid to use plenty of hot cleansing solution. Some disagree in regard to the use of peroxide of hydrogen, but in the writer's practice he has found it most useful. Oftentimes the canal, in ears of children, is so small that the secretion blocks it, and where this happens irrigations of any kind often prove useless. If one uses the instillations of peroxide of hydrogen in these cases he will see that he is able to cleanse the ear, otherwise one would get negative results. All cases should be treated systematically, and as often as the discharge indicates it. Most of these cases require irrigations every one, two, three or four hours during the active discharging stage. The writer thinks the heat of the solution, by bringing more pure blood to the seat of trouble, does as much good as the cleansing of the canal. In all of his cases he uses the solution as hot as the patient can stand. In most all homes a douche-bag is to be had that will hold two or three quarts, and, by inserting a straight-tip medicine-dropper in the end of the tube, will prove as useful as any other irrigating apparatus.

Sometimes it is advisable to insert a gauze wick into the canal between treatments, and other times a slight amount of suction may prove beneficial, but in infants this is not used as often as in adults.

In following up the after-treatment the writer finds, in those cases in which inflation of the tube has not been used, that one is more liable to have impairment of hearing. Generally most otitis cases show a tendency to recur until about the twelfth or fourteenth year. Therefore, these cases should receive proper attention, and the nasopharynx should be attended to between attacks. Postnasal douches, with warm saline or Dobell's solution followed by applications of argyrol or some of the iodine preparations, have proven very useful.

The tendency of a paracentesis is to heal rapidly, so by giving the ear careful attention and instilling peroxide of hydrogen, followed by irrigations, one can, as a rule, keep free drainage established. The cases following infectious disease, as measles, diphtheria, and scarlet fever, give us the most trouble. On account of the extensive destruction of the middle ear, and complications, great care should be used in treating these cases. Even with the great destruction done in some of these cases, we get very good results as far as hearing is concerned. In all cases of acute suppurative otitis media in babies there is less chance of mastoid development than in adults, as the drainage is more favorable. The experience of most otologists has been that mastoiditis can be prevented, in all but a small percentage, by careful attention in the early stage.

For most doctors it is quite a task to make a satisfactory explanation, and even the specialist oftentimes finds it difficult in babies. Opinion of persons who occasionally make aural examinations is of little value, but by constant examinations, as of other parts of the body, one can in time be able to satisfy himself in regard to his observations. When infants have not responded to thorough treatment of their ear condition by the external canal and are still losing their vitality, without any signs of improvement, it is time to consider opening and draining from behind. In all ear cases in which there has been discharge with pain and there is a sudden cessation of that pain with diminution of secretion, we must watch for the spreading of the pathological condition to the mastoid cells. Do not wait for periosteal abscess over the mastoid before considering an operation.

BROMIDE ERUPTIONS IN INFANCY.

In the *Southern California Practitioner* for April, 1915, VAN METER states that infants are more prone to have skin diseases than adults. The reason for this is apparent when we consider the fact that the newly born has a sudden transition from a stable temperature and surroundings free from external irritation to the

outside world where exposure is had to the extremes of heat and cold, chemical irritants such as hard water, soap, coarse talcum powder, dyestuffs, crystals of inspissated olive oil, moist surfaces in apposition, wet diapers, salivation during dentition, and toxins eliminated through the skin from the gastrointestinal tract; actual traumatism and the friction of clothing.

Skin lesions having their etiology in these conditions are dealt with more or less fully in the current text-books on obstetrics and pediatrics. A class of cases, however, which is either barely mentioned or else ignored in works of this kind is dermatitis medicamentosa or drug eruptions. These eruptions disappear on withdrawal of the drug; and, with the exception of the physiological flush of belladonna, probably many of them are not properly diagnosed, as few fall into the hands of a dermatologist.

Among the drug eruptions are those due to the ingestion of antipyrin, arsenic, belladonna, bromides, chloral, iodides, mercury, opiates, quinine, and salicylates.

Van Meter's paper is limited to the consideration of the bromide eruptions.

Bromides are freely absorbed from the intestines and circulate in the blood as bromides. Next to the blood serum in bromine content is the mother's milk. A smaller amount is found in tears, saliva, and the skin. In the blood and secretions a variable percentage of chloride is replaced by bromide; hence in a diet low in sodium chloride, a larger percentage of chloride is replaced than in a diet in which table salt is freely taken.

Elimination takes place through the kidneys, mother's milk, and, to a lesser degree, through the intestines and skin, in the order named.

Through renal insufficiency or a deficient salt diet the elimination of bromides is often quite slow. Rabuteau found bromine in the urine a month after the discontinuance of the drug. Simankowsky found bromine in the urine of a dog four months after 53 grammes of sodium bromide had been given in divided doses.

The slowness of elimination in certain cases accounts for the fact that bromide eruptions sometimes do not appear until after the discontinuance of the drug. These eruptions may simulate almost any skin disease, although the commonest form is an acne.

Why some individuals can take bromides with impunity over long periods of time without any skin manifestations, while others two days after taking small doses have a skin eruption, is a question to be settled. The easiest explanation is that it is an idiosyncrasy, or shall we call it drug anaphylaxis?

Van Meter reaches these conclusions:

1. Bromine is eliminated to a considerable extent through the mother's milk.

2. Bromide and iodide eruptions may simulate almost any known skin disease.

3. Drug eruptions should be considered in the differential diagnosis of skin diseases in infancy.

THE ACTION OF CINCHONINE, CINCHONIDINE, AND QUINIDINE ON THE ISOLATED UTERUS.

In the *Journal of Pharmacology and Experimental Therapeutics* for May, 1915, HALE tells us that the action of cinchonine, cinchonidine, and quinidine on the isolated uterus was determined by adding the sulphate of these bases to oxygenated Locke's solution in which a segment of guinea-pig's uterus was suspended. It was found that all three alkaloids induced strong contractions of the uterus with an increase in the strength and regularity of the spontaneous movements. These effects were still equally marked after the motor sympathetic had been paralyzed by large doses of ergot and after atropine had been given, thus indicating a direct action on the muscle. These alkaloids thus act on the uterus like quinine, but all of them are considerably more effective than quinine is. Quinidine sulphate, the most active, appears to be ten times as effective as quinine. As an explanation of this it is pointed out that quinidine is the dextrorotatory isomer of the levorotatory quinine, and thus behaves like a number of optical isomers which, having only a structural difference in chemical constitution, nevertheless differ widely in action.

SCOPOLAMINE-MORPHINE TREATMENT IN LABOR.

The *Journal of the American Medical Association* of May 22, 1915, contains an article by BAER in which he concludes that the prolongation of labor, the increase in the number of fetal asphyxias, the excessive thirst and intense headaches that are so distressing, the difficult control of patients and avoidance of infection by soiling of the genitals, the more frequent postpartum hemorrhages, the blurred vision, the ghastly deliriums persisting far into the puerperium, the inability to recognize the onset of the second stage unless by risk of more frequent examinations, the masking of early symptoms such as antepartum hemorrhage, rupture of the uterus and even eclampsia, the violence and uncertainty of the whole treatment, the general bad impression given to the patients who are being taught to approach the "horrors of labor" in fear and trembling, constitute so severe an arraignment of this treatment of labor cases that the writer feels compelled to condemn it, leaving open the question of the merits of a single dose of morphine and scopolamine in those cases in which he has hitherto given morphine and atropine.

THE TREATMENT OF PNEUMONIA.

GARDNER, writing in the *Birmingham Medical Review* for April, 1915, thinks that the treatment of pneumonia in private should be carried out as far as possible on the same lines as in a hospital. The essentials are:

1. Absolute rest in bed from the very first.

2. Two good nurses.

3. Extremely careful watching from the commencement for any signs of trouble needing treatment, and the keeping of most careful and accurate records from the very first. It is not necessary nor right to make a daily examination of the state of the lungs, but it is necessary every day—

1. To ascertain the state of the heart, especially the position of the apex, and the right border of cardiac dulness.

2. To note the state of the veins of the neck.

3. By percussion to ascertain the resonance of the area lying between the right nipple, the right border of the normal cardiac dulness, and the upper border of the normal liver dulness.

4. To watch for any alteration in the position of the lower border of the liver.

5. To estimate the general condition as indicated by pulse, temperature, rate of respiration, decubitus, color, etc., and to inquire into the action of the bowels, the amount and condition of the urine, the food and stimulants taken, and especially the amount and quality of the sleep.

All this can be done without exhausting the patient in the slightest degree. Patients should be kept in a well-ventilated room whose temperature should not be above 60 degrees, and should get as much fresh air as possible. Care should be taken as to the total amount of fluid nourishment given, and a careful record of it should be noted, for it is easy to give too much. The addition of carbohydrates to the milk in the form of milk-sugar or malted milk is, the writer believes, very helpful; for carbohydrates are potent sources of energy, and, as they are burnt up entirely into CO_2 and H_2O, they do not load the system with waste products or burden the kidneys. If the milk causes flatulence, this can be prevented by the addition of 2 grains of citrate of soda to each ounce of milk.

It is very important to see that the bowels act well, especially at first; an initial dose of calomel is, the writer thinks, always beneficial. Sleep is most important, and should especially be insured during the first few days of the illness, when it is quite safe to give a dose of Dover's powder, or a small hypodermic of morphine. Later on opium in any form may be extremely dangerous, deadening the sensibility of the respiratory center; but we may do much good by finding out and removing any cause of sleeplessness, and also by warm sponging, hot bottles, cold to the head, and by easing of the cough, loosening the expectoration with such drugs as iodide of potassium and chloride of ammonium. The

condition of the mouth and teeth should be very carefully looked to, to prevent oral sepsis or pyorrhea and subsequent secondary infections.

The great dangers in cases of pneumonia seem to the writer to be:

1. Exhaustion from restlessness, pain, or want of sleep.

2. Cardiac failure—failure of the right heart, or of the left heart, or of the heart as a whole, failure of the right heart being far the most common.

3. Circulatory failure from vasomotor paralysis, accompanied by increasing cardiac weakness.

4. Insufficient aeration of the blood from various causes.

5. Secondary infections from oral sepsis.

6. An unrecognized pleural effusion, increasing the already great difficulty of breathing.

7. Hyperpyrexia.

One must never forget the possibility of such complications as pericarditis, peritonitis, and meningitis.

Exhaustion from restlessness, pain, or want of sleep is a very real danger. Restlessness is often due to too many, too heavy, or too tight clothes; sometimes to a loaded rectum. It can generally be relieved by attention to these things, and by warm and tepid sponging. Pain is due to pleurisy or pericarditis. It can be relieved often by poultices or hot applications; if more severe, by leeches. If very severe during the early days we must never hesitate to relieve it by a hypodermic of morphine, for pain rapidly exhausts a patient. Of sleeplessness the writer has already spoken. He cannot too strongly emphasize the harm it may do. Patients die worn out who, if they had had sleep and rest in the early stages of their illness, might have had sufficient strength to pull through. When thinking of rest and sleep, we must never forget the extreme importance of mental rest and relief from anxiety—one of the many great advantages of hospital treatment.

Cardiac failure in one form or another is the commonest cause of death in pneumonia. Failure of the heart as a whole is generally due to toxemia, or exhaustion; but failure of the right heart is far more common, and is due in great measure to mechanical overdistention and subsequent dilatation. We must always be on the lookout for the first signs of it, for we can do very much to relieve it. The earliest sign of all is increase of deep cardiac dulness to the right of the sternum.

One common cause of it is a frequent, irritating, violent cough. One can almost see the right heart dilating each time the patient coughs, and we must do all we can to relieve or stop that cough.

Another cause often unrecognized is overfeeding. The writer will never forget a case in St. Bartholomew's Hospital when he was house physician. The patient was an elderly countryman who walked into the ward, though really very ill and only fit to be carried on a stretcher. He was most plucky and uncomplaining, and won the hearts of his nurses, and they all tried their very best to pull him through. Nevertheless, he got worse and worse, and the writer was called up three times one night to administer strychnine and ether. His color became more and more dusky and his veins more full, and his breathing and the action of his right heart more labored. When Dr. Andrew, the writer's chief, saw him, he at once asked how much food and stimulants he was having. A calculation was made, and the sister proudly reported that he had had 7½ pints of food in the last twenty-four hours, and the writer forgets how much brandy. Dr. Andrew at once cut down food and stimulants alike, the food to two pints, and the man rapidly improved and made a good recovery.

The best treatment for overdistended right heart is to relieve it by leeches or bleeding. Either of these means will often save a life. Of bleeding the writer has had but little personal experience, but now that it is almost impossible to get leeches he supposes we shall have to have recourse to it. Dr. Burd, of Shrewsbury, assured the writer that it is far more effectual than leeches, and that in the old days he saved many a life by it. Dr. Andrew used to relate that once there was a very fatal epi-

demic of pneumonia in Iceland. Most of the patients were far out of the reach of any doctor, and these mostly died, but those who got a doctor generally recovered. Bleeding was the only treatment employed.

Failure of the left heart or of the heart as a whole can best be met by the use of alcohol, strychnine, caffeine, or camphor. Of these the writer is accustomed to rely upon strychnine given hypodermically, and he feels quite certain that he has many times seen it save life. Some use digitalin, and the writer has often done so himself or seen it given, but he has never been able to satisfy himself that he has seen it do any good. Camphor he has only used once; the result was so satisfactory that he will certainly try it again. Oxygen is probably a good heart stimulant. One hears good reports of its use bubbled through absolute alcohol or brandy; the writer has never yet so used it, but certainly means to try it.

Circulatory failure from vasomotor paralysis is said by some to be the chief cause of death. It certainly plays a part. The best drugs for combating it are, the writer thinks, strychnine and quinine. Caffeine is highly recommended by some. Pituitrin should be of use, but he has never tried it himself, and its action is said to be very brief. Cold-water sponging is said by some to be the most valuable treatment, but the writer imagines that when the vitality is low its action is very temporary, and is soon followed by depression. Certainly one's experience of cold baths and cold sea bathing with weak and delicate people would lead one to expect that. Personally he is inclined to think that the best prevention of vasomotor paralysis would be treatment in the open air, and he is sure those who have experienced for themselves the tonic effect upon the vasomotor system of sleeping in the open air will be inclined to agree with him.

For insufficient aeration of the blood, the urgent need is to prop the patient up in bed, so that he can bring the extraordinary muscles of respiration into play. This probably does good also by relieving the right heart, the action of gravity causing the patient to bleed himself into his abdominal veins. For the really dangerous malaeration of the blood, associated with bronchitis and coarse mucous râles in the upper bronchi and trachea—the well-known death rattle—atropine administered hypodermically is the weapon, and it will sometimes pull a case round which seems absolutely hopeless. The worst of the writer's cases last autumn was a man who had suffered long from chronic bronchitis and dilated tubes. He was brought in almost in a dying condition, rallied for a time, and then got steadily worse. He was given strychnine and atropine grain 1/150 every four hours. When the writer saw him at midnight the second night he was apparently moribund and had loud tracheal râles. The writer injected 3 grains of camphor and left 1/50 atropine to be given two hours later, and repeated every four hours. When the writer came round in the morning, to his astonishment the patient was alive and better. The writer was told that the patient rallied slightly after the camphor, but improved greatly and permanently after the large dose of atropine. He was wildly delirious for some days, but eventually recovered completely.

SCOPOLAMINE AND NARCOPHIN SEMINARCOSIS DURING LABOR.

In the *Journal of the American Medical Association* of May 22, 1915, LIBBY says it is the difficulty occasionally encountered in resuscitating the infant which provides the chief objection to the use of scopolamine and an opiate during labor. And while the writer has met no case in which resuscitative measures failed, the prolonged efforts occasionally required enables him to understand that fetal deaths may result from the treatment. In Chrobak's clinic, one fetal death in 107 cases seems chargeable to scopolamine and morphine, and Avarffy recorded one fetal death in fifty cases.

On the other hand, the writer is strongly encouraged by the testimony of mothers to continue the use of scopolamine and morphine seminarcosis in obstetric cases. In those which the writer has observed,

approximately four-fifths (twenty-nine patients) remembered nothing which happened after they were under the influence of the drugs, and were unaware that the baby was born until they were told; therefore, these may be counted successful cases. Patients always have a clear recollection of the first dose, frequently of the second, and sometimes of the third. As a rule, satisfactory narcosis is secured between the second and third dose, about two hours after the treatment is begun.

In two instances—so-called partial successes—there was a clear memory of everything which happened during labor, but these patients considered that the treatment had modified their suffering. In four instances the treatment had no effect whatever on the mother. Therefore, experience teaches that once in six or seven cases (17 per cent) scopolamine and narcophin will not have the effect for which they are administered. Siegel also admits 12 per cent of failures. Similar results are observed if morphine is used in place of narcophin. Thus, Tischauer, who collected 2270 cases, found that the frequency of failures, in the reports of observers outside of Freiburg, varied from 20 to 54 per cent.

No injurious effect on the mother was encountered in the writer's experience, but it must not be forgotten that he has rejected cases in which the complications of labor were anticipated. With this caution, and if the patient understands that some difficulty occasionally arises in reviving the child, her wish to receive scopolamine and morphine or narcophin seminarcosis during labor may be complied with. However, physicians must recognize that the method has not reached the perfection which warrants indiscriminate use. For example, even moderate degrees of pelvic contraction make it inadvisable to employ seminarcosis, for in these circumstances its effects may diminish the chances for spontaneous delivery and occasionally necessitate the performance of major obstetric operations. Similarly, the primary inertia not infrequent in the case of elderly primiparas constitutes a contraindication to the use of scopolamine. For the present, therefore, it would seem advisable to employ this drug only when there is every indication that the patient will pass through a normal confinement.

An intimate knowledge of obstetrics is required if physicians wish to administer seminarcosis successfully, for sound judgment must be exercised not only in the selection of cases but also in the management of labor. The supervision of patients who are under the influence of scopolamine and an opiate requires competent assistants. For this reason, and also because the frequency of operative procedures is increased, good hospital facilities are desirable. However, such precautions do not mean that the method is impracticable and that it ought to be discarded. On the contrary, the very satisfactory results in the majority of cases provide the stimulus to secure further improvements in the method which will broaden its field of application and remove its objectionable effect upon the new-born infant.

MACEWEN'S SIGN IN DIAGNOSTICATING CHANGES IN INTRACRANIAL PRESSURE.

Wilcox (*Archives of Pediatrics,* May, 1915) presented a paper on this topic at the last meeting of the American Pediatric Society. He said Macewen's sign was best determined by placing the stethoscope on the forehead just above the base of the nose. The skull was then tapped with the percussing finger or the hammer, over the parietal region, beginning just over the parietal boss, from which the percussing finger should approach to the point at which the stethoscope was applied. This should be carried out on both sides of the head. A typical sign observed in this way consisted in a high-pitched, sharp, short, cracked-pot note. It was most distinct when percussion was being done over, behind, or below the parietal boss on either side, was unchanged as the point percussed passed downward, and diminished in intensity and character as the point percussed approached the stethoscope. The latter point was important in differentiating between a false and a true Macewen's sign, as

the reverse obtained in percussing a normal skull.

The writer concluded as follows:

(1) The skulls of children of various ages and developments have percussion notes peculiar to the state of the cranium. (2) It is possible to establish a note normal to the various types of crania found in infants and children. (3) A positive Macewen's sign existed when variation from the normal note was found. It consisted in a relative change rather than a definite condition common to all diseased crania. (4) The sign was better elicited by the stethoscope than by the unaided ear. (5) Increased clearness of sound when percussion was done over the posterior portion of the skull rather than near the stethoscope was diagnostic. (6) The sign uniformly accompanied conditions of increased intracranial tension and was not found unless this causative factor existed. (7) It is equally applicable to infants and to older children. (8) It was present in 50 of 53 cases of tuberculous meningitis. (9) It was present in 17 of 18 cases of meningitis of other types. (10) It was found to vary directly with the development and recession of cerebral symptoms as complications of disease not directly affecting the central nervous system. (11) It was present in 11 of 15 cases of pneumonia, in five of which lumbar puncture showed increased cerebrospinal fluid under pressure. (12) The sign was uniformly lacking in children normal as to the brain and its coverings.

CEREBROSPINAL SYPHILIS TREATED WITH SALVARSANIZED SERUM.

In the *Journal of the Missouri State Medical Association* for June, 1915, BARTELS reaches these conclusions:

1. The early diagnosis and energetic treatment of syphilis properly controlled by serum reaction would do much to prevent the subsequent development of nerve syphilis.

2. We must always remember to be thorough in treating syphilis to eliminate the possibility of a residual focus which very often will involve the central nervous system.

3. If the cerebrospinal fluid acts the part of lymph to the central nervous system and carries nutrition, it should also be able to carry medicinal substances to the cells of the brain and cord. This then would agree with the view of Swift and Ellis on the direct continuity of the subarachnoid space with the lymph channels and lymph spaces.

4. Diseases of the central nervous system due to syphilitic tumor growths and tabes in its incipiency are as a rule benefited by treatment, but in advanced tabes where the degenerative processes have taken place, the very best to be expected is a retardation of the disease.

5. The intraspinal use of salvarsanized serum is an advance in the therapy of syphilis of the central nervous system, as it furnishes the one avenue of approach for spirillicidal drugs to the heretofore inaccessible spirochetes.

6. The intraspinous injection of salvarsanized serum is a safe operation in the hands of properly trained and equipped men.

A BENZIDIN TABLET TEST FOR OCCULT BLOOD.

ROBERTS in the *Journal of the American Medical Association* of July 17, 1915, points out that it is essential that any test for occult blood shall be accurate, and it is important that it be simple in its technique. The benzidin test, in various modifications, has largely displaced tests previously used, and because of its accuracy and the comparative simplicity of the technique, occult blood testing has come into more general use. It has, however, not been found feasible to make up stock solutions of a benzidin in acetic acid that would keep long, and hydrogen peroxide, because of its instability, has led to frequent errors.

During the past year, after considerable experimenting, the writer has worked out an extremely satisfactory benzidin tablet, and in both private and hospital work he has come to use it to the exclusion of other tests.

This tablet triturate is composed of 1 part

benzidin to 20 parts sodium perborate triturated with great care and made up into a 5-grain tablet. The tablet is moderately friable and is best dispensed in small tubes. The specimen to be tested, either a weak emulsion of the stool or the stomach contents or urine, is placed either in a small saucer, pus basin, or porcelain dish in sufficient quantity to wet the tablet thoroughly, but not to entirely immerse it. A drop or two of glacial acetic acid on the tablet if blood be present gives rise to a more or less immediate change in the tablet to a greenish blue. Experience with its use gives a fairly accurate idea of the amount of occult blood present, depending on the extent and quickness of the color change. If the amount of blood is small, only the edge of the tablet may turn. The delicacy of the test is slightly less than the benzidin-acetic-acid-peroxide test, but has been found amply delicate for practical purposes. There is some danger in too delicate a test, and this has been purposely avoided. Such is the simplicity of this tablet test for occult blood that a nurse or intelligent patient may watch the appearance or disappearance of occult blood without laboratory apparatus of any kind, with merely a small dish, the handle of a spoon to make a thin emulsion, a tablet, and a small vial of acetic acid.

THE RELATION OF CALCIUM TO THE DELAYED COAGULATION OF BLOOD IN OBSTRUCTIVE JAUNDICE.

In the *Archives of Internal Medicine* of July 15, 1915, LEE and VINCENT state that obstructive jaundice in the presence of a liver functioning in an adequate manner causes a delay in the coagulation time of the blood. This condition must be differentiated from certain somewhat similar conditions in which the liver itself is seriously damaged. The delay in the coagulation of the blood in obstructive jaundice is apparently due to a lack of available calcium in the blood and can be counteracted by the administration by mouth of calcium salts. Other workers have demonstrated an increase of calcium in the blood in obstructive jaundice, and have suggested the plausible explanation that the bile pigments in the blood form a more or less loose union with the calcium salts and so render the calcium unavailable for immediate use in the process of coagulation. Lee and Vincent's clinical experience shows that the need of more calcium can be very simply demonstrated at the bedside by the "calcium in vitro" test.

The results of their studies would tend to show further that while the effect of bile in delaying coagulation is largely counteracted by calcium, yet bile has in addition an inhibitory effect on the formation of thrombin and on the action of thrombin already formed. Moreover, bile in very strong concentration *in vitro* entirely prevents coagulation even in the presence of an excess of calcium. It is to be doubted, however, if in obstructive jaundice such concentration of bile ever occurs as will entirely prevent coagulation of blood.

Clinically this need of calcium can be met by the administration of any calcium salt. Lee and Vincent have mainly used calcium lactate in the dosage of 100 grains a day. Calcium must be administered over a period of several days before any marked effect on the coagulation time is seen. It is evident that the necessity of employing large doses depends on the difficulty of securing the absorption of calcium from the gastrointestinal tract rather than the need of such large amounts of calcium.

In a dog, and presumably in human beings, prompt effect on the coagulation time can be obtained by the intravenous injection of calcium salts in solution. Apparently calcium can be given in this way without bad results, but its effect on the coagulation of the blood is transitory.

From a clinical point of view it would seem desirable in all cases of obstructive jaundice to make several determinations of the coagulation time. In these cases of obstructive jaundice relatively large doses of calcium should be given by mouth in order to meet the excessive demand for calcium which is present in this condition. The early administration of large doses of calcium seems particularly important in cases in which a deficiency in the available calcium is shown by the "calcium in vitro"

test and in cases which may subsequently demand surgical interference. When an immediate effect is desired the intravenous administration of calcium is indicated and seems to have no bad effects.

THE MEDICAL TREATMENT OF INTESTINAL STASIS.

THIRD in the *Canadian Practioner and Review* for June, 1915, states that the ill effects of sedentary occupations are well known. The abdominal muscles weaken. To prevent this, exercise is necessary. There is no better exercise than the daily brisk walk. When active exercise cannot be carried out from age, obesity, etc., massage should be substituted. The only patients the writer knows of who will carry out massage for any length of time are the neurasthenics. Cannon-ball massage is probably the best, but the novelty of even this soon wears off.

It is generally recognized now that the prime cause of visceral displacement is lack of support from the abdominal muscles. The wearing, therefore, of a carefully adjusted abdominal support may be of the greatest advantage under two conditions:

1. In very lax atrophic abdominal walls it supplies the necessary support and should be worn constantly—*i. e.*, during the day.

2. In weakening of the abdominal walls, when exercise and massage fail, it prevents displacements with all their mischievous consequences. In the latter condition the support should be worn only at intervals.

In order to derive the greatest benefit from these supports, care should be exercised in taking the measurements. If they are too wide, they press unduly on the ilii, causing great discomfort, besides defeating the end for which they are worn.

We underestimate at the present time the power of the mind, even over so material a function as intestinal evacuation. We seem to have forgotten the peristaltic effect of great emotion. Probably all of us have known active purgation to result from the administration of two pillulæ micarum panis.

The power of the mind over the body has limits, but those limits have never been ascertained.

A mixed diet, not too carefully selected, abundance of liquids, the formation of appropriate habits and the proper attitude of mind, where anxiety and worry are eliminated, will prevent or cure at least 75 per cent of our cases of chronic constipation.

What of the remaining 25 per cent? Administer laxatives in the smallest quantity that will produce the desired effect. There is a wide range to choose from.

Up to fifty years of age the writer is in the habit of prescribing a tablet of cascara to be taken each night, alternating at intervals with a pill of aloin, strychnine, and belladonna. The agencies already referred to must not be neglected.

TREATMENT OF ACUTE PELVIC INFLAMMATIONS.

WARD (*American Journal of Obstetrics*, June, 1915) states that a large proportion of the cases of parametritic exudate following labor or abortion, and many cases of perimetritis, will resolve without abscess formation if let alone, and that if pus does form, if in small quantity, it may be absorbed, and frequently with the preservation of function of the pelvic organs.

The too ready resort to the curette, or to other intrauterine manipulations, at the onset of uterine infection is responsible for the formation of exudates in a very large percentage of cases.

Many cases are operated upon unnecessarily, or too early, with the result of increasing or disseminating the infection, thus prolonging the convalescence and sometimes producing a fatal termination.

Incision and drainage should not be employed until the indications of a localized collection of pus are well defined and associated with evidence of septic absorption.

The selection of the proper form of drainage applicable to each case is important. Rubber tubing or gauze should be chosen according to the conditions found at the operation.

Failure to cure a pelvic abscess by colpo-

tomy and drainage is nearly always due to neglect in not keeping the incision open sufficiently long.

In acute pelvic suppurations, when the indications for interference are present, the operation of choice should be a simple incision and ample drainage, with the object of conserving the organs.

VALUE OF MODERN FUNCTIONAL KIDNEY TESTS TO THE CLINICIAN.

SONDERN (*American Journal of Obstetrics,* June, 1915) divides kidney tests into two general classes: First, those tests which are used to indicate prognosis in renal disease, namely, the phenolsulphonephthalein test, and the amount of incoagulable nitrogen in the blood. Second, those tests which are intended for the early diagnosis of abnormal renal function and for the differentiation of the various types of nephritis, namely, the ability to excrete water, sodium chloride, lactose, and potassium iodide.

The phenolsulphonephthalein test was introduced by Geraghty and Rowntree and to a great extent superseded the other tests of this class as an indicator of renal functional ability. The technique is very simple and is as follows: 300 to 400 Cc. of water are given one-half hour before the test is made to insure free urinary secretion. After the lapse of the half-hour the bladder is completely emptied and, noting the time, 6 milligrammes of the drug are given subcutaneously or preferably intravenously. All urine secreted during the first two hours is collected and the contained phthalein estimated colorimetrically by a very simple and accurate method. The average excretion from normal persons in two hours is from 60 to 85 per cent of the amount administered. A large number of published reports agree with those of the originators, in the statement that the decreased excretion of the drug is in direct ratio to the severity of the renal insufficiency, but that disturbed function of the cardiovascular system with passive congestion of the kidneys shows tests indicating decidedly lowered functional ability of the kidney in the absence of any true renal lesion. As it is oftentimes difficult and sometimes impossible to decide to what extent cardiovascular fault influences the condition, the deficiency of this test becomes apparent. This for example makes the test by itself quite useless in pregnancy and other conditions accompanied by passive renal hyperemia.

The accurate determination of the amount of incoagulable nitrogen in the blood with the use of relatively little blood has recently been made possible by the colorimetric method devised by Folin and Dennis. This is by no means as simple a test as the foregoing and requires care and experience if accurate results are to be obtained. The average excretion by normal persons is variously stated by different investigators using the method advocated, and ranges between 22 and 40 milligrammes in 100 Cc. of blood. Here, again, the increased amount of incoagulable nitrogen in the blood is usually in direct ratio to the severity of the renal lesion. It has been shown, however, by Agnew and others that the cases of cardiovascular lesion and passive renal congestion show no abnormal amount of incoagulable nitrogen in the blood, and consequently this test combined with the phthalein test would seem to constitute as good a method as we have to determine prognosis, not only in renal disease but also in combined cardiovascular and renal cases. The detailed accounts of cases published by Agnew are particularly instructive in this connection, and it is this combination which has been found of special use in determining renal function in pregnancy when there is a coexisting passive congestion of the kidney.

Schlayer and his followers have attempted to determine separately the function of the vascular or glomerular and the tubular apparatus of the kidney with the idea of differential diagnosis. They claim that disease of the glomerular apparatus interferes with the excretion of water and lactose, and disease of tubular apparatus interferes with the excretion of sodium chloride and iodide of potash.

These tests are not difficult. The water

test consists of an intake of about one liter, preferably early in the morning, in the form of weak tea, which is usually excreted in large part by normal kidneys within four hours. In diseased kidneys of the vascular type this water excretion is either deficient or abnormally great, indicating either inefficiency or abnormal sensitiveness of the glomerular apparatus, which is confirmed by the delayed excretion of lactose in both.

The lactose test consists in the intravenous introduction of 2 grammes of lactose, of which 60 to 80 per cent is recovered in the urine of normal persons within four hours, while in cases of vascular nephritis this excretion is delayed from eight to twelve hours.

The sodium chloride test consists in taking 10 grammes in capsules by mouth, which is excreted within twenty-four hours by normal persons, while in tubular nephritis this excretion is delayed from 80 to 100 hours. In serious cases this test is not devoid of danger.

The iodide of potash test consists in the administration of 0.5 gramme, which in normal persons is excreted in forty hours, while in cases of tubular nephritis the excretion is delayed for 80 to 100 hours.

By using these tests Schlayer claims the ability to distinguish the different types of acute and chronic nephritis: Acute or chronic vascular nephritis showing increased or diminished water excretion and delayed lactose excretion with normal chloride and iodide excretion. Tubular nephritis showing delayed chloride and iodide excretion with normal water and lactose excretion. Mixed cases frequently occur which will show different combinations of these reactions. Schlayer also claims to be able to determine slight functional faults by these means before clinical signs of a renal lesion are apparent.

While these methods for the differential diagnosis of the different types of nephritis are certainly ingenious and doubtless of use in many instances, the results obtained are often conflicting, and, while we must admire the progress made, the last word has by no means been spoken. While Schlayer's classification of nephritis into the vascular and the tubular variety has many anatomical and clinical points in its favor, and is appealing in its simplicity, there are also reasons why many do not feel justified in abandoning our older classification, and for this reason one cannot but feel that something still better may be devised. Refinements in diagnosis, such as have just been considered, in no way replace our older clinical and laboratory methods of diagnosis of renal and cardiovascular disease; they are simply further aids, helpful in some instances, but confusing and probably inaccurate in others. The increasing tendency of some clinicians to rely exclusively on relatively untried modern laboratory methods of diagnosis at the expense of careful bedside observation is unfortunate, in that it is apt to discredit the laboratory worker anxious to render every possible aid. The fact remains that the careful bedside worker who least needs laboratory aid in diagnosis is the very one who gets the most help from it, for he learns to appreciate its limitations as well as its value.

TREATMENT OF CARCINOMA OF THE CERVIX BY RADIUM.

ANSPACH (*American Journal of Obstetrics,* July, 1915) concludes that treatment by radium must be reserved for those cases of carcinoma of the cervix in which removal by operation is out of the question; it is certainly unwise to depend upon the use of radium alone. Nothing can take the place of operation in an early case. Radium must be used as far as possible in every postoperative case to prevent recurrence. In those unfortunate instances in which the disease has advanced beyond the possibility of radical surgical treatment, radium will cure a percentage not yet determined, and will give the stricken people formerly condemned to die a new hope.

The therapeutic effect of radium is probably analogous to the therapeutic effect of the *x*-ray; only in radium we have a substance which can be placed directly in the diseased area, overcoming in this way some of the mechanical difficulties encountered with the *x*-ray in the treatment of cervical

carcinoma. Radium will probably prove to be as effectual against certain advanced cancers of the cervix as the *x*-ray has been curative in certain malignant growths of the skin. The case particularly suitable to such treatment is cancer of the squamous type which is moderately destructive and invasive, and in which there are no metastases or deep extensions.

With few exceptions up to the present time, radium has not been used properly. It must be exhibited in massive doses, and the case must be kept under observation until the local subjective and objective symptoms have disappeared. The difficulties in carrying out these recommendations are the enormous cost of radium, the limitations of its supply, and the lack of hospital facilities.

In order to avoid deception in regard to radium treatment of all sorts, the collections of radium should be limited to hospitals and public institutions, and the existence of all radium supplies should be registered in the Department of Public Health, so that fraudulent advertisers and sham preparations of radium can be apprehended.

ON THE BACTERIAL FLORA OF WOUNDS PRODUCED DURING THE PRESENT WAR.

DUDGEON, GARDNER and BAWTREE (*Lancet*, June 12, 1915) have selected some hundred cases from their series of observations on superficial and deep injuries of the bones and soft parts produced by shell, shrapnel, and bullets. A fact which appears to be of greater interest is the close similarity of the bacterial flora of these wounds to the infection of the tissues such as occurs among civilians in any large hospital. There is near kinship in the bacteriology of severe injuries of the soft parts produced by shrapnel and injuries in civil life infected with horse-dung.

The bacillus aerogenes capsulatus, streptococci, and coliform bacilli are the ones usually found. If the patient dies from a rapid infection it is usually caused by the gas bacillus. If he survives streptococci often take chief command of the infection. This is the bacteriological history of many of the shrapnel wounds. The mere presence of B. aerogenes capsulatus is not the important factor in the wound, but it is the presence of this organism in tissues which are under considerable increase of tension. The most important group of bacteria from many aspects is the anaerobic family, among which the bacillus of tetanus and the B. aerogenes capsulatus are the most conspicuous.

Twenty-one wounds in all yielded cultures either of B. tetani or of B. aerogenes capsulatus, or of both—wounds of most diverse nature. With one exception every wound was also infected with aerobic bacteria—usually staphylococci, colon bacilli, the proteus. Of the eleven patients in whose wounds the bacilli of tetanus were found, nine had been treated prophylactically with tetanus antitoxin at an early date, and at no time did any one of these exhibit any symptoms of tetanus. Two had not received any prophylactic injection, and one developed the disease and the other did not, thus showing that the wound may become infected with B. tetani without tetanus resulting, quite apart from the question of antitoxin, although there is no reason to doubt that the prophylactic injection of antitoxin has been the means of saving the majority of these patients from the most serious disease arising from wound infection.

Indeed, it has been shown that a wounded man may act as a carrier of these dangerous bacilli for at least two months after the date of the wound, and probably for a much longer period, without any reason on clinical grounds to suggest that these bacteria are present in the tissues.

Whatever the nature of the wound, whether it be slight or severe, without a careful bacteriological investigation it is impossible to be sure there are no tetanus spores lurking in its depths. B. aerogenes capsulatus was found on 13 occasions. Although its presence was not confined to any single type of lesion, yet certain varieties of wounds suggested its activity. Bone lesions, with a profuse and perhaps offensive discharge, are the most liable to yield

cultures of this organism. It seems certain that some special conditions must be present in order that B. aerogenes capsulatus may give rise to gas gangrene, and that in the majority of infected wounds it is either rapidly eliminated or it settles down to a purely pyogenic or even saprophytic life. One would naturally expect to find an organism of this nature more frequently in recent than in old wounds, and on the whole this is so. Nevertheless, the statistics show that the bacillus is able to survive at least four weeks from the date of the infection.

The facts here presented concerning these two potentially virulent and highly resistant spore-bearing organisms make it undoubtedly very advisable that special precautions should be taken in the sterilizing of surgical instruments which have been used in operating upon wounds. There are occasions when instruments are merely "introduced" to the boiling water, but the writers' bacteriological findings are sufficient evidence of the danger that may arise, more especially with the massing together of wounded which must take place owing to the present circumstances. In one instance a culture of the B. aerogenes capsulatus was obtained from a suppurating wound, but the bacteriological findings were not taken into account. The limb was amputated, but death occurred from rapidly spreading gas gangrene within thirty hours.

The colon bacillus was found in 11 cases, while in 15 instances coliform bacilli were cultivated. Experience teaches us that a rapidly spreading infection of the tissues which resents active interference is generally a streptococcal infection in spite of the presence of the bacillus coli or a coliform bacillus in the discharge, but owing to the difficulty in isolating streptococci under such circumstances the presence of these bacteria may not always be recognized. We have no record of an actively spreading infection of the tissues or severe irritable wound from which colon bacilli or coliform bacilli have been obtained in pure culture, but always in association with streptococci, which corresponds with infective lesions of a similar type met with in ordinary practice.

It may be of interest to mention that the B. coli and coliform bacilli were cultivated from lesions widely different clinically, such as a surface granulating wound of the hand with little discharge, and a foul suppurating and deep tissue infection with copious exudate. In two instances out of the total of 26 colon bacilli were present in pure culture, and in each case the discharge was slight in amount and the temperature was normal.

True proteus bacilli were isolated in five cases, with sinus formation and an abundance of purulent discharge. Pyocyaneus was found under similar conditions in four cases. Staphylococci were cultivated in 41 of the 100 cases. Some thirty strains were grown in the customary series of sugar-containing media. They often appear to possess only a low degree of virulence, though it should be remembered that they are capable of undergoing a sudden increase of virulence if the barriers of protection which the body has set up are broken down by an overzealous operator or even by quite insignificant manipulation.

Diphtheroid bacilli were met with on fifteen occasions, but clinically the sources from which the bacilli were cultivated were various. The authors especially dwell upon the existence and persistence of dangerous anaerobes in the system and the need this implies of absolute cleanliness and prolonged disinfection by heat of all materials which can come in contact with such wounds.

ACUTE TRAUMATIC DISPLACEMENT OF THE UTERUS.

BARRINGER (*American Journal of Obstetrics,* May, 1915), after reporting a number of clinical cases, calls attention to the value of early diagnosis and treatment. This for the sake of the woman herself, since it generally means complete cure. The longer the period of displacement the greater the loss of tone in the ligaments and changes in the uterus and appendages due to passive congestion, hence the smaller the chance of a non-operative recovery.

It is of importance to arrive at a correct diagnosis because of the legal aspect of

these cases. In four of the author's six cases this was an important feature. In two or probably three of the cases the diagnosis had been overlooked. In two cases a rectal or vaginal examination had not been made.

As the terms "railway spine," traumatic lumbago, concussion of the spine, coccygodynia, traumatic neurasthenia, traumatic hysteria, may often be loosely applied to cases with grave organic lesions or functional disturbances of the cerebrospinal system, with often unfavorable prognosis as to curability and return of the individual's capacity for work, in the eyes of the jury these terms may carry with them a verdict quite out of proportion to the real injury.

The true estimation of these cases is often difficult, for in addition to the displaced uterus there may be some spinal injury, and the disastrous effect of litigation on the nervous condition of these women must not be forgotten.

From the author's experience with these cases he would make an invariable rule that the pelvic organs should be carefully examined before any diagnosis is made.

An acute traumatic displacement of the uterus unrecognized may completely disable a woman for the time being. If it remains unrecognized the woman will probably drift into years of invalidism trying to adjust herself to her misplaced organs, and during this time she may develop symptoms which will justly give rise to the various conditions enumerated above.

THE ABORTIVE TREATMENT OF GONORRHEA.

ROBINSON (*American Medicine*, April, 1915) thus describes the treatment: The patient urinates and the anterior urethra is gently washed out with about four ounces of warm normal salt solution (7:1000). No force must be used, and not more than a drachm or two of solution should be at any time in the urethra (so as to prevent any fluid from opening the cut-off muscle and penetrating into the posterior urethra), and the meatus should not be tightly closed by the tip of the syringe, so that the fluid may flow freely back. A few drops (5 to 10) of a 4-per-cent solution of cocaine, eucaine, or alypin are then instilled into the urethra. One drachm of a 2-per-cent protargol solution is then injected, closing the meatus with the fingers, held in for five minutes. In three hours a drachm of a one-per-cent solution of protargol is injected and held in for three minutes. This injection—1 drachm of a one-per-cent protargol solution held in for three minutes—is repeated every two hours until four injections have been given. The next four injections, at three-hour intervals, are given with one-half-per-cent solutions; and the next four injections, also at three-hour intervals, are given with one-fourth-per-cent solutions. If we use argyrol, the method is the same, only the strength of the solution is different. The initial solution is 50 per cent and the subsequent solutions 25 or 20 per cent.

The protargol and argyrol solutions may also be used alternately. The discharge is examined for gonococci every day. At the end of two or three days we know what we may expect. If the abortive treatment proves successful and the gonococci have disappeared or are becoming less and less, well and good. If not, then also well, though not so well; at any rate we have not hurt our patient, and we may then proceed with the regular treatment of acute gonococcal urethritis.

While there are differences of opinion among urologists as to whether abortive treatment should ever be tried or not, there is practically no difference of opinion as to when it should not be attempted. All agree that abortive treatment should not be attempted if the discharge, no matter how scanty, has lasted longer than forty-eight hours; nor if the discharge is profuse and purulent, no matter of how short duration; nor when the meatus is red, puffed, and swollen; nor when the glans is turgid; nor when there is considerable burning on urination; nor when there are the slightest signs of strangury; nor when the patient is suffering with painful erections or chordee. It is too late then to attempt abortive treat-

ment, and that's all there is to it; and besides all the patient's symptoms are almost sure to become greatly aggravated.

BLOOD TRANSFUSION BY THE CITRATE METHOD.

LEWISOHN (*Surgery, Gynecology and Obstetrics,* July, 1915) after a series of animal experiments applied the citrate method in twenty-two blood transfusions on eighteen patients. He notes that sodium citrate can be used with perfect safety in a ratio of 0.2 per cent. Concerning the donor, he advises refusing one who has been repeatedly used. The donor is put on the table, a tourniquet applied to the arm, and the vein punctured with a cannula. The blood is received in a sterile graduated glass jar (500 Cc.) containing 25 cubic centimeters of a 2-per-cent sterile solution of sodium citrate at the bottom. While the blood is running into the glass receptacle, it is well mixed with the citrate solution by means of a glass rod. After 250 cubic centimeters of blood have been taken another 25 cubic centimeters of citrate solution are added. If less than 500 cubic centimeters of blood are taken (*i.e.,* in infants), the amount of citrate solution added to the blood is reduced accordingly.

In cases in which we expect to take more than 500 cubic centimeters of blood we have another glass container (500 Cc.) ready to be used in exactly the same manner. The glass jar containing the blood is then put aside and covered with a towel to safeguard against contamination. The author has not found it necessary to immerse it in hot water or surround the jar with an asbestos covering. The blood is then taken either into the recipient's room or the recipient is brought into the operating-room. Lewisohn considers it a great advantage that this method does not require donor and recipient to be in the same room; this lessens the physical shock of the whole procedure for the patient. In fact the donor's blood may be collected in the laboratory or office and carried to the patient's bedside.

Another very great advantage of the citrate method is that as there is no connection between the donor and recipient, the donor is safeguarded against contagion of any disease or infection which the patient may have.

The recipient's vein is then punctured or exposed by a small incision; the cannula is introduced and attached to a salvarsan flask or a glass funnel. It is advisable to fill the rubber tubing connection between flask and cannula with some saline solution so as to prevent air from getting into the circulation. After the connection is made the blood is poured into the salvarsan apparatus. In order to prevent sudden overloading of the circulation it is advisable (especially in larger transfusions) to stop the flow of blood from time to time by compressing the rubber tubing. After the blood has been injected the cannula is removed and the transfusion is thus ended. The whole procedure can be performed with the greatest ease and without any hurry, because the citrated blood, as we have seen, can be kept for two or three days in the glass jar without danger of clotting.

It is rather immaterial what size needle we use for the injection of the blood; in children, for instance, we can use a very fine Goldenberg or Schreiber needle. But it is of the greatest importance for the successful application of the citrate method that we use a large size cannula in taking the donor's blood. Lewisohn has lately punctured the vein with a Kaliski cannula (gauge 11, B. & S.), and thus collected 500 cubic centimeters of blood in less than five minutes. The shape and construction of the needle are immaterial so long as one of large caliber is used. He warns against the use of needles of smaller caliber (for instance, 14 or 16), because if the blood does not shoot out of the vein, and comes out only drop by drop, it is apt to clot in the glass jar. The writer thinks that Zingher, who has lately published a paper advising a combination of the Lindeman and the citrate method, did not use needles of sufficiently large caliber. For if we use needles of sufficiently large caliber, we do not need syringes, which only complicate this method, and certainly are not to be considered as an improvement in the technique.

The 2-per-cent citrate solution can be sterilized and resterilized without losing its efficiency. He selected a 2-per-cent solution because it simplifies the calculation (30 solution to 300 blood). By varying the percentage one can easily reduce the quantity of solution to be added to the blood. It might be just as advisable, for instance, to add 50 Cc. of a 4-per-cent solution to 1000 Cc. of blood. The author has had made up sterile glass tubes (like those for saline solution) containing 50 Cc. of the 2-per-cent solution ready for immediate use.

Case histories are appended to the paper. They comprise inoperable carcinoma, preoperative transfusions, purpura hemorrhagica and allied conditions, lymphatic leukemia, severe anemia, gastric hemorrhage, actinomycosis, and puerperal sepsis. Some of the cases showed marked polyuria lasting twenty-four hours, without microscopic or macroscopic change in the urine. In five minutes there was a marked rise in temperature; in three of these a chill. There was always an automatic rise in the hemoglobin after transfusion both immediate and subsequently. The success of the procedure is most striking in profuse hemorrhage. In different forms of poisoning it produces excellent and lasting results, and in cases of secondary and primary anemia.

SPLENECTOMY FOR HEMOLYTIC ICTERUS.

ELLIOTT and KANAVEL (*Surgery, Gynecology and Obstetrics,* July, 1915), after discussion of familial and acquired types, note that it is generally considered that the hemoglobin molecule is split in the circulating blood or spleen into two fractions. First, the iron-containing (hematin) fraction is conserved in the liver, bone-marrow, and other parenchymatous organs; and the second, the pigment-containing fraction, is excreted by the liver as bilirubin. The bilirubin being converted into urobilinogen in the intestine is absorbed and excreted as such by the kidneys.

As to the pathogenesis, recent operative results set aside all former theories which do not ascribe to the spleen the principal etiological rôle. It is safe to say that if the spleen is not the sole cause it is at least an essential factor in the pathogenesis of this disease.

Chauffard and Widal consider hemolytic icterus essentially a blood disease, the splenic tumor spodogenous, and the decreased osmotic resistance of the red cells the essential factor.

As to the results of splenectomy, Elliott and Kanavel present a table of 48 cases available for study. Of these 16 were of the acquired type, 23 familial, and 9 were unclassified.

The symptomatology and results in the cases in which the diagnosis has been confirmed by operation serve to crystallize our knowledge of the clinical picture.

The symptoms in the congenital or familial type differ in no way from those found in the acquired type, except that the latter would seem to progress somewhat more rapidly and more frequently to severe acholuric crises. This is emphasized when we note that in 10 out of 15 cases of acquired jaundice the duration of the jaundice had been short—in fact, less than four years. In regard to the familial type, it was frequently noted that the children in an affected family seemed to suffer more severely than the parent, and they showed a greater tendency to severe crises and the development of complications.

The disease may appear in variable intensity in various members of the family through several generations, and in the great majority of cases is of such a mild character that the patients may live to old age and demand no therapy. In these the condition might pass unnoticed were it not for the icteric tinge to the skin. In certain individuals, however, the process is so marked as to give rise to the typical picture demanding treatment. This may be described as a chronic, mild icterus, with or without indefinite weakness and malaise, upon which are engrafted from time to time the so-called "crises," consisting of marked increase in size and tenderness of the spleen, with malaise, headache, and slight fever, accompanied by an intense hemolysis, sometimes with hemoglobinemia at the

height of a crisis, as with anemia, urobilinuria, bile pigment in the blood but not in the urine, and a deepening of the acholuric jaundice—this differing from the ordinary jaundice in that it is non-toxic, with no pruritus, no petechia, no bradycardia, and is of light lemon color; the liver is slightly enlarged and tender and may present the liver crises produced by the passage of the thickened bile or pigment stones through the ducts, giving the typical signs of gall-stone disease. Unless this complication occurs the stools are of normal color.

An examination of the blood will show an increased fragility.

The amount of anemia depends upon the efficiency of the hemopoietic system, which, when exhausted, gives the blood picture of pernicious anemia. One can always find evidence of excessive regeneration—*i.e.*, polychromatophilia, nucleated reds, and certain reticulated bodies in the red cell stained by vital stains, as first described by Vaughan.

During the so-called crises the spleen increases in size and becomes somewhat tender. The spleens removed at operations averaged over 1000 gms. in weight, one exceptional spleen being reported as 4500 gms. In seven only of the 28 cases in which this finding was noted was the spleen under 950 gms. At operation evidences of perisplenitis were present, with adhesions in eight cases. The age of onset, as noted in 13 of the acquired cases, was most often in the neighborhood of the third decennium. None was seen under sixteen, and three occurred later in life, at thirty-nine, fifty-one, and fifty-two, respectively. In all of these cases, however, owing to the lack of evident symptoms the disease may have been present previously. While most of the familial cases are noted as having had jaundice in infancy, some did not show this until later, or they were described as being anemic.

The anemia in cases coming to operation varied widely, a few having as low as a million red blood-cells, and some slightly less than normal, but the majority showed from two and one-half to four millions, with a color index of one in nearly every case. The white cells were normal in number, except in two cases, in which they were below normal, and one extraordinary case, in which they reached two hundred thousand. In this patient they reached ten thousand four weeks after operation. Sporadic leucocytosis was seen in many cases at the time of liver crises. In the authors' patient it ran as high as thirty-eight thousand.

In practically every case in which the urine was examined, urobilin or urobilinogen was found, and there were no bile salts except in those cases in which the patient was suffering from gall-bladder complications. Bile salts were noted in the blood in some instances. The pains in the abdomen were referred to the splenic region, and in a few cases to the liver also. Slight enlargement of the liver was noted in nine and great enlargement in two cases, although such enlargement cannot be said to be a conspicuous sign. There is also nc distinct tendency to hemorrhages of any type, although epistaxis was noted in four patients, bleeding of the gums in one, and hematemesis in another. The frequency of acholuric crises varied greatly, in the more severe cases appearing every three to four weeks and in the milder cases infrequently.

The most frequent complication met with was the so-called liver crisis, due to the passage of thickened and excessive bile or of gall-stones. In four cases gall-stones were removed, one of these being in the common duct. In two cases an exploration of the gall-bladder was performed with negative findings.

In many cases the course is so mild as not to call for treatment, and in the more severe cases many years may elapse before the severe crises or complications bring the patient to the physician. The use of iron, arsenic, and other drugs has not served to alter or ameliorate the condition, and *x*-ray therapy has been tried without result. On the other hand, the remarkable benefit secured by splenectomy would seem to recommend this procedure, not alone in these severe cases, but also in the milder but progressive types, to forestall the onset of complications on the part of the gall-

bladder and relieve those patients who are constantly more or less ill, but who do not, as yet, suffer from severe crises. This would seem to be indicated particularly in the younger individuals, where we should not wait for the large splenic tumor or marked general disability. On the other hand, they would not advise the procedure in the absence of some disability, since a larger proportion of these cases apparently grow to old age without any subjective evidence of illness. Where feasible it is advisable to operate in the free interval between the crises.

Of the 48 cases collected only two died, one shortly after operation, and the other in six weeks, from sepsis, a surprisingly good result when one considers the serious condition of some of the patients. As for the ultimate results, the 46 patients who recovered are reported as "cured"—that is to say, they were relieved of their jaundice and crises. It is true that in most cases the short time that has elapsed between operation and the report precludes final statement, yet among the reports are those of Dawson, recording the case done by Sir Spencer Wells, operated upon twenty-seven years previously; Bland-Sutton's case, after ten years; Banti's, after eleven years; Roth's, after six years; while in nine cases the patient had been observed over six months after the operation.

The effect upon the blood picture was immediate. In some cases reports are made at various stages, and in other cases only once. In seven cases reported in the first two weeks, four gained from one to two million reds; in eight cases reported in the third and fourth weeks, three gained over a million, two over two million, and one over three million; in nine cases reported in from three to six months, five gained a million, four three million, and one five million; and, finally, of 10 reported after six months one gained one million, five two million, and four three million, leaving one that had not gained appreciably, but the blood count here showed four and a half million. These increases in every case brought the blood approximately to normal; in 22 cases it was above four million, and of these, in 17 above four and a half million, and in three, six million or over. The hemoglobin followed the rise in the number of reds. The white blood count was normal unless there were complications.

The effect upon the fragility of the red blood-cells was less conspicuous. The fragility was increased before operation in every case, varying from 0.50 to 0.70. One case is mentioned as becoming normal in five weeks, but for the most part little change was noted before three months, when several are mentioned as being nearly normal. On the other hand, Sir Spencer Wells's case showed a high fragility twenty-seven years after operation, and Roth's after three and one-half years, so it is evident that while one frequently will have a decrease, yet a normal fragility is possibly the exception rather than the rule, after splenectomy in these cases.

The jaundice decreased in most cases in the first few days, and in nearly all instances was absent at the end of two weeks, while the acholuric crises, with the attendant malaise, headache, and fever, ceased entirely. While too few observations have been made over periods long enough to estimate the effect upon the gall-bladder complications, it is not unreasonable, however, to assume that the tendency to these would be decreased or removed.

DISINFECTION OF THE HANDS AND ABDOMINAL SKIN BEFORE OPERATION.

McDONALD (*Surgery, Gynecology and Obstetrics,* July, 1915) advises the following solution:

> Acetone (commercial), 40 parts;
> Denatured alcohol, 60 parts;
> Pyxol, 2 parts.

With this solution, in no case was any growth obtained after thirty seconds' immersion. This period, however, is too short in practice, and one minute is advised to provide a margin of safety. Preliminary washing with soap and water was found to be no aid to efficiency, but was rather a slight hindrance. It had the additional disadvantage of irritating the hands. No

growth was obtained in a number of experiments when the hands were simply sponged with the solution for one minute and not immersed. This sponging was considered only as an emergency method in case of great haste and scarcity of solution.

The method advised is to treat the hands in the germicidal solution in a vessel sufficiently large to admit the hands and rub with a nail-brush for the nails, and a gauze cloth for the arms, to aid the solution in permeating every crevice. The experiments were conducted with very little or no mechanical friction or rubbing, in order to make doubly sure of the value of the final solution; but, in practice, this is recommended as an additional precaution.

This solution has the following advantages:

It is reasonably cheap. It does not irritate the skin, as the author has proved by many thousand immersions of his hands and arms. It contains a fat solvent, acetone, which causes the solution to penetrate. The alcohol is a good vehicle. It contains a strong germicide, twenty times as germicidal as carbolic acid in equal strength, and this germicidal value is not impaired by the alcohol or acetone. This was proved by taking the coefficient of the pyxol after it was in solution in alcohol and acetone.

The solution thus has the germicidal value of phenol in 40-per-cent solution (if such a solution could be made), plus the germicidal action of the solvent. Pyxol is a dark liquid, extracted from coal-tar creosote, which forms a white emulsion with water, and a light mahogany-colored solution with alcohol and acetone. Its germicidal efficiency is twenty times that of phenol. The action of pyxol is not impaired by pus, soap, serum, and other albuminous matter. Pyxol is said to have the following composition: 40 per cent pyxol oil, 30 per cent neutral hydrocarbon oil, and 30 per cent saponified vegetable oil. It is said to be free from carbolic and cresylic acid. The neutral vegetable oils are present only as emulsifying agents.

In conclusion, it is to be advised that the hands be disinfected before operation by immersion in this solution for one minute with the aid of a nail-brush and a gauze cloth. By this means more complete disinfection may be obtained than by any of the known methods. The solution is inexpensive, unirritating to the skin, and efficient. It may be used repeatedly. It will acquire a sediment of various detritus which in no way impairs its efficiency.

McDonald has used this solution for the sterilization of the hands and for the skin of the abdomen of women, and with uniformly satisfactory results. On the abdomen it is rubbed for two minutes before operation after the patient is under ether without any preliminary washing. Since using this solution he has had better wounds with more perfect healing than ever before, and the same report has come to him from other surgeons who have used it in their practices for sterilizing the abdominal skin.

Since it is possible to sterilize the hands so thoroughly and in such a quick and easy fashion, there does not seem to be any further advantage in using rubber gloves, for the hands can be resterilized after contamination in less time than it takes to remove the contaminating gloves and put on a clean pair. Since it is possible to sterilize the hands so thoroughly McDonald has not used gloves while operating.

McMullen, reporting on the use of McDonald's solution over a period of eight months covering 276 cases of major operation, practically all laparotomies and hernias, notes three cases of skin infection which might be attributed to causes other than those connected with the use of the solution. He notes that healing takes place more readily than under iodine skin disinfection, wound repair being accelerated by at least three days, and believes that wounds through iodine-prepared skin surfaces are more edematous and slower in healing than clean wounds made through skin surfaces prepared with simple soap and water or alcohol scrubbing.

Applied to the hand it is unirritating and is almost ideal as a skin disinfectant.

Stanton in the same journal observes that this solution may be used on a wet skin surface, that it does not stain, dries very

quickly, and is cheap. He has employed it for fifteen months with only two infections in 240 otherwise clean cases, a record never before equaled in his own work. During the year 1914 there was not a drop of pus collected by him. The wounds heal without evidence of chemical irritation.

POLLINOSIS (HAY-FEVER): A CONSIDERATION OF ITS TREATMENT BY ACTIVE IMMUNIZATION.

OPPENHEIMER and GOTTLIEB (*New York State Journal of Medicine,* June, 1915) define hay-fever or pollinosis as a disease which manifests itself in the spring, from the latter part of May or the early part of June, until the middle or end of July; and in the autumn from the middle of August to the end of September or early October. It is characterized by itching of the eyes and lacrimation, itching of the palate and face, sneezing, serous discharge from the nose, obstructed breathing, and, if the attack is very severe, sooner or later coughing and difficult breathing accompanied by wheezing.

It is caused by the action of pollen grains from flowering plants. The pollen is carried by air currents and inspired with the air breathed; if the recipient is susceptible to the particular pollen, an attack of pollinosis promptly ensues.

Dunbar examined the pollen of 30 varieties of graminaceæ and cyperaceæ and found them active, as also swamp-pink, lily-of-the-valley, hairy Solomon's seal, rape, and spinach. It was found that ragweed, goldenrod, asters, and chrysanthemums cause symptoms when applied to the mucous membranes of susceptible individuals, while normal controls did not react. It was also demonstrated that a patient may be susceptible to one or more pollens, and Koessler has made out a long list of plants having pollen which cause hay-fever symptoms. In this list are found the common oat, the fescue, the barley, timothy, Kentucky blue grass, rye, and wheat. As predisposing factors may be mentioned nasal and pharyngeal pathological conditions and heredity. Among the nasal and pharyngeal conditions obstruction takes a prominent place, such for instance as enlarged turbinate bodies, adenoids, spurs, also diseased conditions of the membranes, such as atrophic and hypertrophic rhinitis, and suppurative accessory sinus disease. There seems to be a particular permeability of the skin and mucous membrane transmitted from the parent who has suffered or is suffering with this or some allied ailment to his or her offspring. More males are affected than females. The condition is not fatal nor are there any autopsy records.

The condition must be regarded as being due to a sensitization of the individual by the pollen contents through the respiratory tract. There must, however, be at the time of sensitization an abrasion of the mucous membrane so as to make this absorption possible. When the yearly attack is about due, the patient first notices an itching at the inner side of the eyes, which may disappear, only to recur with greater intensity in a few days. This usually is accompanied by itching of the nose, the skin of the face and palate, which may continue for some time without becoming worse, but in due time the patient experiences fulness in the head, stuffiness of the nose, and, in the morning particularly, attacks of sneezing followed by a seromucous discharge. At this time the eyelids itch intensely, so much so that the patient can hardly refrain from rubbing. Itching of the palate is also pronounced, and the patient very often scratches the palate with the finger. Weakness is complained of and there is a disinclination to stir about. Perspiration is oftentimes free. This condition continues abating and increasing from time to time. If the nose is completely obstructed, as it usually is, sleeping is interfered with, and soon a cough supervenes, and to the clinical picture are added attacks of shortness of breath and wheezing, particularly at night. At the end of the seasonal attack all of these symptoms gradually subside, leaving no evidence of the suffering and discomfort which has been endured. The spring variety usually does not last longer than four weeks, while the fall variety lasts about six weeks. Occasionally patients present them-

selves who suffer with "hay-fever" symptoms throughout the entire summer.

The eyelids appear red, the conjunctival blood-vessels are engorged, and the mucous membrane between them is whitish-pink. There are occasionally small papular elevations in the skin of the face. The mucous membrane of the nose is swollen, the blood-vessels are engorged, and the mucous membrane between these blood-vessels is also whitish-pink. The palate blood-vessels are prominent and the intervening mucous membrane is anemic. The temperature of the patient ranges between 98° and 101°, seldom reaching 102°. From this description it can readily be seen that the mucous membranes are not inflamed. They are more inclined to be pale, while the blood-vessels which course through them are engorged.

Given a patient who periodically each spring or summer becomes ill with a sickness which corresponds to the description mentioned in the symptomatology, and if these symptoms begin and end approximately the same time each year, it can safely be said that the patient is suffering with pollen disease. The question is, which pollen is operative in a given case? To answer this query it is necessary to test the patient with the pollen of all the flowers which bloom during the time of the attack.

There are three methods by which it is possible to know which pollen is operative in a given case. A drop of weak extract of a given pollen may be instilled into the lower conjunctival sac of the eye. The one which produces congestion and swelling of the caruncle and mucous membrane of the lid is the one to which the patient is sensitive. A very minute quantity of the extract may be injected intracutaneously, and the pollen to which that patient is anaphylactic will cause swelling and redness around the spot where the pollen extract is deposited. A very minute quantity of pure pollen may be gently rubbed into a small scarification wound of the skin and a wheal will develop at and around this point of scarification if the patient is susceptible to that pollen. Some patients are sensitive to more than one pollen, and it seems that there may be in some cases a general susceptibility to all pollen, so that when the reactions are marked it is possible to conclude that this is the specific pollen which is causative of hay-fever in a given case.

Many patients become progressively worse each season, while with others the symptoms are milder after each attack.

While the patients are suffering with the attack it is possible to give them relief with drugs, particularly cocaine and adrenalin. Weak solutions of these may be instilled into the eyes and applied to the nose. In this way the itching of the eyes and obstructed breathing are mitigated.

Patients suffering with this disease may dwell in localities where the causative pollen-bearing flowers do not grow, such as Fire Island, Green Mountains, White Mountains, and the higher altitudes of the Adirondack Mountains. A pilgrimage to these places must be made each year, and they must remain away the entire six weeks to avoid the disease.

According to Rosenau, Anderson, Otto, and others, if on the seventh, eighth, or ninth day after the first injection a massive dose of antigen is injected into the animal, the symptoms of anaphylaxis do not occur on exhibiting a dose of antigen on the twelfth day. The refractory condition so produced is called anti-anaphylaxis. This same animal will, twenty or thirty days later, become slightly sensitive to the antigen, the symptoms being mild, fatal reactions rarely occurring.

It should be possible to treat patients suffering with pollinosis by one of four methods:

By injecting a dose of pollen extract just before the "hay-fever" time and repeating the procedure in twenty to thirty days.

By injecting a large quantity of immune serum during the attack. From a patient about two ounces of blood were taken; after the proper precaution of a Wassermann reaction, eight cubic centimeters of the serum was injected subcutaneously into a patient of thirteen years suffering at the time with a violent attack of pollinosis. Within thirty-six hours this little patient had no symptoms of "pollinosis," and no

signs of the disease returned during the entire season.

By injecting very small amounts of pollen extract at intervals of ten days or less, so that only minute quantities of anaphylatoxin be formed and the patient's tolerance raised.

By injecting very small doses of anaphylatoxin made *in vitro* to produce the same results as in method number three.

By repeated injections of pollen into horses and rabbits Dunbar and his associates were able to produce an immunity in these animals, as tested by the complement fixation reaction, especially in rabbits whose serum in some cases would fix complement in dilutions of 1:50,000. Dunbar has transferred passive immunity to individuals by injecting the serum of these animals.

From these experiments has been evolved pollantin, a horse-serum antitoxin, which in itself can produce the condition of anaphylaxis by repeated use and can thus interfere with the cure that it is supposed to accomplish. This product has been a failure, notwithstanding that the German Hay Fever Association has reported 59 to 69 per cent of successful results with it.

Noon and Freeman, in 1911, published the results of their work on the active immunization of pollinosis by injecting gradually increasing doses of timothy-grass pollen extract. They reported eighteen cases. Excellent results were obtained in three, thirteen were markedly improved, while two cases were not benefited.

In a preliminary report Clowes in 1913 gave his results in the treatment of eight cases of pollinosis. All of the cases were satisfactorily influenced.

Koessley between 1910 and 1914 treated forty-one cases, of which four were cured, 29 markedly improved, and eight were not benefited.

The technique followed during 1913 and 1914 has given an effective antigen for curative purposes.

The pollen was ground up for several days with sand and a sufficient amount of 5-per-cent sodium chloride solution with one-half-per-cent carbolic acid added to prevent the growth of microörganisms. This mixture was placed in the thermostat for seventy-two hours at 37° C. and then filtered by suction. None of these extracts by this method gave the biuret reaction and few gave a positive ninhydrin reaction. The filtered extract was then precipitated with eight parts of absolute alcohol and filtered quickly in a Buchner funnel to avoid any denaturization, if possible, of the active principle by so strong a concentration of alcohol. The precipitate was dried and weighed. This precipitate on testing has never given a biuret or ninhydrin reaction. It is partly soluble in 0.85-per-cent sodium chloride solution and physiologically active in very weak solutions.

A total nitrogen content of one of the extracts of ragweed was performed, and it showed 0.066 per cent of nitrogen. This same solution, on December 20, 1913, gave a positive ninhydrin reaction, whereas on March 24, 1914, three months later, the test was doubtful. This shows that pollen extracts in solution deteriorate on standing.

The dried precipitate was dissolved in 0.85-per-cent sodium chloride solution with ¼ per cent of carbolic acid and serial dilutions made. With these solutions the patients were treated by hypodermic injections.

Eleven cases were treated in 1914, before and during the season for autumnal catarrh. Six cases were treated in advance of the attack. One of these was cured for the season, four had very mild symptoms, and one was not improved. Five cases were treated during the attack. The symptoms of four subsided after receiving from one to four injections, whereas one patient received no benefit. Altogether there were five cures for the season. In four cases there was marked improvement. Of the two cases that were not improved, one had a polypoidal degeneration of the middle turbinate with underlying bone necrosis. The patient has distinct asthmatic attacks every night, and it was impossible to say whether the attacks were due to his pollinosis or to the local nasal condition. The other was a physician who reacted both to ragweed and goldenrod pollen. He received in all 33 injections, alternating the

ragweed and the goldenrod extracts. He came very irregularly for treatment. It is possible that at times the treatment was too intensive, and his physical condition was so poor that possibly he could not develop a tolerance.

Nine of their cases reacted to ragweed pollen and two reacted to that of both ragweed and goldenrod. Both of these latter cases received both goldenrod and ragweed antigen hypodermically. One was cured, but the other was not improved. When a patient is sensitive to more than one pollen, individual doses of each extract should be administered, in order to determine when the tolerance is sufficiently raised for each. Mixing the antigen is too empirical.

There are two ways of determining when a patient has become sufficiently immune to warrant discontinuance of the treatment:

With a complement fixation test.

From the size, intensity, and duration of the wheal produced by skin scarification, at different times, namely, before and during the treatment.

The scarification method is the one generally used to diagnose and determine the degree of immunity induced. The wheal produced by the initial vaccination is measured, its time of appearance and its duration noted. After five or six treatments the patient is revaccinated and the wheal is observed again as before, and compared with the former results. When the wheal is very small or does not appear, the patient is sufficiently immune and probably will go through the season with very mild symptoms or none at all.

While the immunity may not be successfully carried over to the succeeding year, recurrences are much milder at least and patients require less reimmunization. An attack the following year can probably be overcome by very few injections.

The best time to begin treatment is probably about ten weeks before the attack may be expected to occur. Regularity of attendance at about weekly intervals is important.

The authors feel that cures were not accomplished in two cases because treatment was begun too early; and in two other cases because the patients were treated too irregularly. Furthermore, it is probable that some of these cases were susceptible to pollen other than that of ragweed and goldenrod. At the time of their initial work they were not prepared with as large a variety of pollens as they now possess for the continuance of the work along broader lines, which they hope in the future will enable them to bring about a large percentage of cases influenced by their attempts at immunization.

PRIMARY ACUTE AND SUBACUTE OSTEOMYELITIS OF THE SPINE.

VOLKMANN (*Deutsche Zeitschrift für Chirurgie,* Bd. 132, Heft 5 and 6), reporting from Payr's clinic in regard to the diagnosis of acute and subacute osteomyelitis of the spine, says that in only about one-third of the 87 cases reviewed from the literature was the diagnosis made clinically with certainty. This difficulty in diagnosis depends not only upon the lack of clarity in the symptoms, but also upon the various interpretations which may be put upon the symptoms. One must take into account the history of a previous infection or trauma, the sudden onset with fever, rapid pulse, vomiting, pain in the spine, perhaps radiating to the extremities; pain and crepitation on pressure over the spinous processes, especially if the lamina is involved; swelling and redness may occur over the affected area and puncture may reveal pus. If a fistula has formed a sequestrum or roughened bone may be felt with the probe. The blood usually shows a high leucocytosis, and pus germs may be found in the urine. If an abscess has broken into the spinal canal the spinal fluid will show a flaky turbidity and a large number of polymorphonuclear leucocytes. The *x*-rays are of value when they show something positive; negative findings are of no value. The complications which often exist are very confusing —for example, in four cases there was typhoid fever; in three, cerebrospinal meningitis; in two, rheumatism; and in one each, influenza, general sepsis, acute myelitis, subphrenic abscess, peritonitis, and

appendicitis. The general average mortality has been 41.8 per cent.

The prognosis depends among other things upon the promptness of diagnosis and treatment, the virulence of the bacteria, the acuteness of the course, and the portion of the vertebra and the region of the spine affected. The mortality is greater in the cases in which the neck and the lumbar region are involved, also when the body of the vertebra is invaded. The nature of the complications has an important bearing on the prognosis.

Operative measures stand at the head of therapeutic efforts. If the spinous process is affected a median-line incision is required, but when the body or the transverse process is the site of the infection a lateral incision is made. It is not sufficient to simply incise and empty the abscess, and it is dangerous to do so because, as the history of various cases shows, when this is done the result is retention, burrowing, and fistula formation. It is essential that the source of the pus formation should be eliminated. After operation the wound should be flushed out with sterile normal salt solution and packed with iodoform gauze. If an abscess has broken into the spinal canal, laminectomy of one or more vertebræ must be done, and, if the pus is subdural, the dura must be incised.

THE EMPLOYMENT OF ETHER IN SEPTIC PERITONITIS AND GUNSHOT WOUNDS.

WATERHOUSE (*British Medical Journal*, No. 2823, 1915) has introduced ether into the peritoneal cavity on sixty occasions, in fifty-nine patients (one patient was on two occasions subjected to this treatment). There were 24 cases of acute appendicitis, one of pneumococcal peritonitis, six of gastroenterostomy, four of acute cholecystitis, one of perforation, four of tuberculous peritonitis, and other cases of similar nature. Two of the 59 patients died. Three ounces is regarded as the maximum dose to be left in the peritoneal cavity for the adult. Ether is usually poured through a drainage tube on its introduction after the closing of the abdominal wound, the tube being sewn about closely and its end occluded after introducing the vapor. It is stated that the postoperative course of the patient is more easy and free from discomfort than similar cases in which ether is not employed, and that the bowel recovers its tone earlier and flatus is passed sooner.

As to the employment of ether as an injection into the joints, Waterhouse believes that this method will supersede all others. He follows Murphy's technique, excepting he uses ether in place of formaldehyde. He reports cases in which he employed the principle of non-drainage for the cure of acute suppurative arthritis. The first involved the shoulder and was due to the gonococci. In this joint a 2-per-cent formalin glycerin solution was thrown in and extension was applied. It was noted that recovery occurred within seven days. In the second case, one of the knee-joint, colon infection resulted in bony ankylosis. Three of his ether cases were presumably of metastatic origin, the last case the result of a stab wound. The quantity of ether injected should be 2 drachms. There was a case of probable gonococcic knee-joint completely cured by two ether injections; a case of septic knee-joint cured by two treatments and extension, the joint having recovered completely on the twelfth day. In the case of suppurative arthritis of the right temporomandibular joint, probably due to gonococcal origin, fifteen minims of ether were injected into the joint above the meniscus and three minims into the joint below. The pus aspirated from the joint contained staphylococcus aureus in pure culture. The pain shortly became intolerable. Extension was procured by means of a piece of india-rubber about 1 inch square and ¾ inch thick, and under anesthesia this was inserted between the molar teeth. Two days later the joint was aspirated again and 10 minims of ether injected. Two months later there was free, normal action.

There was a case of streptococcic nature, infection of the knee-joint due to a stab.

Two drachms of ether were injected and 20 pounds weight applied. The joint was aspirated on the third and fifth days, and on each occasion 1/5 drachm of ether was injected. The patient was left in bed until the seventeenth day with a freely movable joint. There was a case of acute purulent arthritis of the shoulder-joint of seven days' duration with rupture of the capsule, allowing pus to escape in the periarticular tissues. The injection on two occasions of ether, together with continuous extension, brought about extraordinary improvement.

The effect of ether on grossly infected wounds, especially gunshot wounds, is warmly commended. As to the iodine method of treatment, he considers it painful, inefficient, and deserving only of condemnation. Many of the septic wounds that came under his care were those which had been painted with iodine. He makes the statement that the daily instillation of a drachm of ether into the bladder in an aggravated case of bacillus coli cystitis, consequent upon a bullet wound of the cauda equina, markedly improved the condition and caused no pain to the patient.

As to the action of ether on microörganisms, Topley shows that the vapor exerts a distinctly bactericidal action. As to the type of peritoneal effusion produced by ether there follows a clear effusion which does not attain its maximum for many hours. It is seldom very abundant. At no period does the fluid contain any large quantity of cells. Normal saline produced a more highly cellular, though less abundant, exudate. As regards the type of cell present, the endothelial cell predominates during the first two hours, up to which time the polynuclear cells are relatively scanty, but they then rapidly increase at the expense of both the endothelial and small mononuclear cells. From the knee-joint the absorption of ether is extremely rapid, and the resulting effusion into the joint relatively small. No appreciable quantity was present after a shorter interval than six hours. The cells of endothelial type predominated and they were small in number. The animals killed a month later showed normal joints.

The experimental investigation of peritoneal infections showed that the injections almost always markedly increased the severity of the infection. On experimental joint infections where bacterial culture alone had been injected the joint was found to be markedly swollen; in the three animals which received ether in addition to the bacterial culture the joints appeared normal, save for the presence of a minute amount of white caseous material, which showed no structure in stained films. It is noteworthy that the streptococci were grown both from those joints which had been inoculated with the organism alone and from those which had received ether in addition. Both the clinical and the experimental results indicate that intra-abdominal injections of ether cannot possibly sterilize an infected peritoneum, nor does the nature of the effusions produced by the injection of ether lend any support to the idea that the increase in the local leucocytosis is an important factor since the cells are always scanty.

CANCER OF THE TESTIS.

Coley (*Annals of Surgery,* July, 1915) observes that the question as to the greater liability of undescended testes to cancer has never been fully settled. Bulkley has collected 59 cases of sarcoma of the abdominal variety of ectopia. Coley during the past twenty-five years has personally observed 65 cases of sarcoma of the testicle. In 52 the disease occurred in the entirely descended testis, and in 12 in the undescended. About three-fourths of the cases occurred between the age of twenty-five and forty-five. If the testis is situated in the abdominal cavity the diagnosis is rarely made until the disease has reached an advanced stage. Indeed the abdominal pain is often the earliest symptom. On the right side it is not infrequently mistaken for appendicitis. Finally, a tumor appears. The prognosis is exceedingly bad, probably owing to the fact

that an early diagnosis is not often made. In Bulkley's cases excision was performed in 37 with an operative mortality of 10 per cent. Only one of this number was well over three years, and but three remained well over two years. Bulkley believes from present statistics that one in every 75 abdominal testes will become malignant. He advises that if the individual has one testis in the scrotum the other testis should after puberty be removed. Coley believes that this estimate as to the frequency of malignancy in undescended testis is too high. There are three recorded instances of bilateral sarcoma of undescended testes.

As to cancer of the scrotal testis this is also a particularly malignant type. In Coley's series of 48 fatal cases, in 29 the duration of life was one year or less. In every one of the six cases in which it was over three years, the toxins had been used. The duration of life in cancer of the undescended testis is much shorter than in the ordinary scrotal type, varying from three months to eight years. In seven of the twelve cases death occurred within less than one year from the beginning of the first symptom. Death occurred in three years in nearly all of the cases, and in 74 per cent it occurred within one year after operation. Chevassu's statistics show that in 100 cases in which there could be no question of the diagnosis of malignancy, 19 patients were found living and well from four to ten years after operation.

Ewing believes that practically all cases of malignant tumor of the testicle should be classified as teratomas, or carcinomas derived from teratomas.

Hinman's analysis of the cases admitted to Johns Hopkins Hospital shows the ultimate result in 24 cases, of which number 20 are dead and four living. The teratomas of the mixed type exhibit a higher malignancy than the pure round-cell carcinomas. Hinman has collected 44 attempts at radical removal of the primary preaortic lymph area in treating testicular tumors. The fact that over 7 per cent of the few cases so far reported that have been subjected to the radical method were found on subsequent examination of the specimen to have had syphilitic orchitis, induced Hinman to advocate doing the operation in two stages: (1) Simple castration and thorough histological examination of the tumor; (2) the operation for removing the lumbar glands. Five of the patients died of postoperative complications, three of pneumonia, and two of peritonitis, giving an operative mortality of 11 per cent. With the exception of two cases there were no evidences of lumbar metastases before operation. Of the remaining 42, 20 were living, nine over two years, the longest four years and ten months, and the shortest one month. Sixteen, or 41 per cent, died of cancer, all within one year, except two. Over 50 per cent of the cases showed cancer invasion of the lumbar nodes removed at operation. In eleven of these the involvement was so extensive as to be inoperable. In eight of the cases in which the lumbar gland was removed subsequent microscopic examination showed no cancer invasion.

Coley believes that his own series of cases show that cancer of the testis treated by simple orchidectomy, without any appreciable risk and followed by a thorough course of treatment with the mixed toxins of erysipelas and bacillus prodigiosus (also without risk), has a far better prognosis than that subjected to the very extensive laparotomy with removal of the lumbar glands, as advocated by Chavassu and Hinman.

His series represents a far advanced disease at the time the patients came under observation. In only nine the toxins were given immediately after primary operation before recurrence had taken place, and yet in spite of this 13 patients were well beyond a period of three years, and only two of these recovered without the use of the toxins; furthermore, both were of the teratoma type—one almost a pure teratoma and probably not malignant; the other a teratoma with carcinomatous degeneration.

It is further worthy of note that two of the cases of this series were cancer of the undescended testis. In one case the toxins were used after operation, and the patient

remained well over three years, when he died either of metastases or tuberculosis, probably metatases. In the other, the toxins were used as a prophylactic after operation; the patient is now well, eight years.

Very few recoveries from sarcoma of the undescended testicle are to be found in the literature.

CARCINOMA OF THE GALL-BLADDER.

BORCHARDT (*Beiträge zur klinischen Chirurgie*, Bd. 95, Heft 3) states that the symptoms of carcinoma of the gall-bladder resemble somewhat those of gall-stones, though the pain of carcinoma is lasting, does not show remissions as in gall-stone, nor is it so severe. One has to deal with continuous symptoms. Hydrops gradually develops. Fever may occur as a result of infection. Icterus results from infection or from metastasis to the lymph nodes around the ductus choledochus. It is not frequent that one makes a diagnosis of carcinoma of the gall-bladder before operation; it is usually found at operation. It is also true as shown by the literature that exploration of the gall-bladder at operation does not always reveal carcinomatous degeneration. The author mentions a case of his in which operation for gall-stones with the usual drainage was done and no evidence of cancer noted, yet three months later this patient was found to have developed a massive cancer of the gall-bladder and liver. This leads to the advice that if the gall-bladder is the seat of much change at the time of operation it should be removed.

The treatment for carcinoma of the gall-bladder is operation, but this should be done only when every portion of the growth can be removed. Palliative operation is as a rule not practicable and to be avoided.

NOTES ON MILITARY SURGERY.

CRILE (*Annals of Surgery*, July, 1915) contributes an interesting paper embodying some of the results of his experience in the American Ambulance Hospital at Paris. He notes that the great outstanding problem of the surgery in a base hospital is that of infection. In military surgery asepsis has failed, as has antisepsis. Rifle balls usually make clean-cut wounds, only occasionally carrying clothing into them. Shrapnel and shell very commonly carry clothing into the wound—the highly infective clothing being a dangerous factor. In addition, the injuries from shell or shrapnel differ locally from a rifle injury in the following respect: the former produces a larger zone of contused and particularly devitalized tissue, which has a low resistance to infection. Most cases of gas gangrene follow shrapnel and shell wounds. Hence surgeons are now promptly treating these wounds by clearing out foreign bodies, excising the devitalizing tissue, and providing good drainage.

As to the treatment of wounds when once infected, there has been no material progress made since the Franco-Prussian war. In the hope that some new method of controlling infection may be found research along these lines is being carried out. The best treatment for the infected wound seems to be warm moist dressings, immersion in hypertonic solutions of potassium citrate and sodium chloride, and, in severe knee or thigh injuries, the immersion of the patient in a bath. The open-air treatment in many cases gave better results than dressings. Hot packs, immersion in hot water, free incisions, good drainage, physiologic rest, seem up to this time to constitute the best treatment. Crile believes that death from gas gangrene is caused by structural injury to the brain, the adrenals, and the liver. No specific treatment has yet been found. Prompt amputation, leaving the stump wide open and applying peroxide of hydrogen, apparently yields the best results.

Next to infection, shock and exhaustion have probably killed the greatest number of soldiers. As to the treatment of shock under those almost inconceivable difficulties encountered in the larger engagements, the best that can be done is to give morphine. Injuries to the head do well at once, but later secondary changes develop, such as abscess and epilepsy. American dentists

have been particularly successful in wounds of the jaws and mouth. Penetrating rifle wounds of the chest do well. There is usually a quick convalescence and an early return to the front. In some instances, however, a pleurisy develops after the wound seems to have healed. On the other hand, in the case of penetrating shell and shrapnel wounds empyema nearly always develops. Penetrating wounds of the abdomen have baffled the surgeon. Even in the most skilful hands immediate operation usually ends fatally, death being due to shock and infection. Wounds involving the bladder or ureters with shattering of the pelvic bones usually end fatally. The struggle is prolonged but futile.

The handling of vast numbers of compound fractures has brought out some new splints.

Perhaps the most popular splint in the British service is the Balkan splint, one of the few useful products of the Balkan war. It is cheap, simple, can be made by any one, can be used in many ways, and dispenses with coaptation splints and bandages. It consists of two wooden upright pieces at each end of the bed, the one at the head being the higher; these two upright pieces support a ridge pole extending over the patient from the foot to the head of the bed. From this "ridge pole" the leg or arm is slung in slings, the extension apparatus being attached to the upright at the foot of the bed. By this means the limb is kept under extension and in an elevated position. This appliance gives the patient a large range of movement, gives the nurse good opportunity for work, permits dressings without movement, dispenses with splints or dressings, keeps off the weight of bedcoverings, while by the elevation of the limb swelling is minimized.

Crile particularly comments upon the almost unfailing repair of widely shattered shafts of bone. Indeed, he states that with time and patience any bone will repair itself even though the destruction be extensive and infection be present. Large numbers of injuries due to frost-bites were seen in the early months of the war. The so-called frost-bite was not due to the cold alone, but occurred as a result of the combination of three factors—moderate cold, dampness, and tight-fitting shoes and leggings. The best treatment is to keep the feet cool and dry by the application of stearate of zinc powder and exposure to the air. If gangrene had developed it was in most instances superficial. Though sloughing of the external parts was frequently observed, amputation was rarely necessary. Crile points out that the army surgeon is relatively untrained in surgical practice, but he is highly trained in organization, transportation, emergency field work—all of which are of the utmost importance. On the other hand, although the civilian surgeon is untrained in military organization and transportation and field work, yet he is highly trained in the actual care of the patient. Obviously, therefore, the best results are achieved by having the army service take charge of the field service and placing the heavy surgical work of the base hospitals in charge of civilian units, and by having attached to each base hospital a board of consultants or inspectors composed of the most expert surgeons—practical surgeons upon whom can be placed the responsibility of the practical work and the formulation of general principles.

SARCOMA OF THE TONGUE.

BETKE (*Beiträge zur klinischen Chirurgie*, Bd. 95, Heft 3), of Rehn's clinic, states that primary sarcoma of the tongue is of very rare occurrence. In all the literature of the last fifty years only forty-two undoubted cases are reported. The age of the patients varied from eleven weeks to eighty-three years, the latter being the age of the case reported by the author. Six patients were upward of sixty years of age. In only one case did heredity seem to have any influence. Out of twenty-nine interstitial sarcomas there were twelve each of spindle-celled and round-celled, four of mixed round- and spindle-celled, and one of fibrosarcoma; of thirteen pedunculated tumors

six were spindle-celled, one round-celled, three of fibrosarcoma, and one each of myxo-, angio- and adenosarcoma. Diagnosis is difficult, especially in later years of life. Sarcoma must be differentiated from cancer, lues, tuberculosis, and actinomycosis, as well as the various and numerous benign tumors, but this can usually be successfully done.

The prognosis is rather good. In eight of the forty-two cases nothing is said about the outcome, in seventeen there was no recurrence, in nine there were one or more recurrences with final cure, and in nine cases death resulted. The glands are seldom involved. The best form of treatment is operative. The mode of operation depends upon the individual case.

REVIEWS.

HABITS THAT HANDICAP. By Charles E. Towns. Century Company, New York.

The name of Towns has become fairly familiar to many medical men because of efforts made by a layman bearing this name toward the eradication and cure of various drug habits. The present volume deals with the menace of opium, alcohol, and tobacco, and the remedies for this type of menace, if we believe the statement on the title-page. We confess that on taking up any book of this character, even if it is written by a medical man, the doubt arises as to whether these important subjects are or can be treated in a rational manner, since all too frequently the spirit which instigates an author in preparing his text is that of the crusader who is charging an evil with an enthusiasm which usually prevents his judgment from being well balanced. This feeling is naturally increased when the author is a layman. There can be no question that opium, alcohol, and tobacco when abused become a curse to the human being that so abuses them, and there also can be no question that medical men and the laity should be alive to the evils which the abuse of these remedies induces. As the author says, they produce a fate far more terrible than death—a thraldom of misery, inefficiency, and disgrace.

The author in his preface admits that there may be found within the pages of this book remarks that may lead the reader to suppose that he is unduly criticizing physicians, and that, therefore, he is the doctor's enemy, but he asserts that no one in the whole community is a more whole-souled admirer of the medical man than he.

In addition to the preface of the author there is another preface written by Dr. Cabot of Boston, who apparently has become an enthusiastic supporter of the methods of Mr. Towns, particularly as they are carried out by Dr. Alexander Lambert, and he states that since he has seen and used Mr. Towns's method of treatment he can verify all the statements made in this book, excepting those relating to tobacco.

There is a final chapter by Dr. Alexander Lambert, which is quite brief, dealing with the relation of alcohol to disease.

The book is marred by the absence of an index.

The more important chapters deal with the perils of the drug habit, the inefficient treatment for the drug habit, the classification of alcoholics, the classification of habit-forming drugs, and preventive measures for the drug evil.

The author claims in the chapter on the classification of habit-forming drugs that heroin is three times stronger than morphine in its action, that it sets up a definite tolerance more quickly, and, for this reason, shows more quickly a deleterious effect upon the human system.

Under the classification of coal-tar products the statement that those preparations used for headaches and neuralgia are nota-

bly dangerous certainly is not true. In the chapter which names the list of habit-forming drugs they are associated with codeine and cocaine. We have never seen or heard of an instance in which acetanilide or acetphenetidin was used so that the term "habit" could be truthfully applied. These drugs are abused, of course. They often do harm when taken by persons whose headaches are due to brain tumor or uremia, but they do not produce a "habit."

Many of our readers will be interested concerning the chapter upon the injuriousness of tobacco. Here we find that, as we intimated in the beginning of this review, the author represents that type of person who, not using tobacco himself, is inclined to the view that every one else should stop using it. There has been an immense amount written by laymen and enthusiastic anti-tobacco medical men on this subject, but very little that really counts for much. The fact, however, that the vast majority of the human race use tobacco in large quantities indicates that it is not harmful, or else that it produces such wide-spread deterioration in the entire race that there is no longer a standard of health. To state, as the author does, that in bringing about a depreciation of nerve cells tobacco brings, together with physical results like insomnia, lowered vitality, and restlessness, their moral counterparts, like irritability, lack of concentration, desire to avoid responsibility, and to travel the road of least resistance, illustrates that his vision in regard to this matter is askew, the more so when he adds that the time is already at hand when smokers will be barred out of positions which demand quick thought and action. As a matter of fact such a statement has no justification either from the scientific standpoint or from the standpoint of probability.

If any literature is needed, dealing with the important subjects dealt with in this volume, it is needed in the form of a competent, scientific discussion in which judicial decisions, arrived at without bias, will be presented. One of the reasons why such a communication has not yet come from the printer lies in the fact, which every one knows, namely, that all these drugs which are commonly used may be employed with impunity provided they are taken with temperance. It is inconceivable that hundreds of millions of the human race can have used tobacco, alcohol, tea and coffee, decade after decade, firmly convinced that solace, comfort, and benefit come from their employment, if they are all, first, last, and all the time, and for every one, harmful agents.

PHYSICAL DIAGNOSIS. By Richard C. Cabot, M.D. Sixth Edition, Revised and Enlarged. Illustrated. Wm. Wood & Company, New York. Price $3.25.

When the first edition of Dr. Cabot's book appeared we referred to it in complimentary terms. That it was well prepared is evidenced by the fact that the sixth edition now appears ten years after the first edition. As with most books, it has considerably increased in size in order that the author might make it more complete by the introduction of new material without the too rigid exclusion of older matter which he still thinks is valuable.

In looking over the section on Heart Disease we are somewhat surprised to find the statement that after a so-called "Marathon run" the heart is of normal size or even smaller than usual. We think that this view does not agree with the experience of other diagnosticians who have had the opportunity of examining the hearts of young men after severe exercise. We note with interest Dr. Cabot's statement that he is uncertain whether excessive muscular work is by itself capable of causing cardiac hypertrophy and dilatation. If he means by these two phrases excentric hypertrophy we agree with him; but if, on the other hand, he means that he has never seen excessive muscular work produce dilatation, we disagree with him.

When the first edition appeared we expressed regret that the illustrations did not equal in quality the character of the text, and this same criticism still holds, not so much as to the execution of the pictures as to the fact that they do not represent what the legend states. For example, Figure 24, entitled "Lead Dots on the Gums," does not show dots, and no one ever saw dots pro-

duced by the deposition of lead, but shows, on the other hand, discoloration of the teeth where the gums have retracted and exposed the roots of the teeth. So, too, Figure 65, showing a pigeon breast, fails to be of service in that it does not show the upper part of the chest, and to the writer's mind it is questionable whether it really illustrates pigeon breast. Figure 67, bearing the legend "Paralytic Thorax," has no distinctive features over the thorax which are frequently seen in cases of far-advanced tuberculosis. Figure 72, illustrating the method of developing Litten's Diaphragm Shadow, is not in accord with the description of the method as we have seen it practiced or as it is described in other works. The picture in the text of Dr. Cabot's book places the line of vision at right angles to the body. Ordinarily the sign is developed by the observer standing between the patient's feet and the window with his eyes at a distance of three or four feet from the lower thorax, the line of vision forming an angle of 45 degrees with the latter. In Figure 72 we also fail to find the letter "L" which is referred to in the legend.

These minor criticisms in no way detract from the value of the book. As a whole it is an excellent manual for both student and practitioner, and even those who consider themselves well-trained diagnosticians may on reading its pages obtain much useful and valuable practical information.

A Text-book of Pathology. By Alfred Stengel, M.D., and Herbert Fox, M.D. Sixth Edition. Illustrated. W. B. Saunders Company, Philadelphia, 1915. Price $6.00.

The sixth edition of Stengel's Pathology appears under a double authorship in that he has associated with him Dr. Herbert Fox, who, within recent years, has become prominently identified with pathology, and who is, therefore, well qualified to bring to the task of revision a full acquaintanceship with the recent advances which have been made in this department of medicine.

The present edition is considerably larger than the earlier edition, both in the size of the page and in the amount of material which it contains. The number of its pages is 1045, and there are 460 illustrations in the text, many of which are in colors, and in addition fifteen colored plates. Many of the chapters have been almost entirely rewritten. A new section on Transmissible Diseases has been added. The Terata have been incorporated with a brief chapter on Teratology. Important additions have also been made to those portions of the book which deal with the glands of internal secretion, and the chapter on Technique, which formed a part of previous editions, has been excluded since special works on technique in the pathological laboratory are now numerous and adequate. Those portions of the book which have dealt with Diseases of the Nervous System in previous editions have been somewhat unduly redundant and, therefore, have been cut down.

The chief characteristic of Stengel's Pathology, when it appeared in earlier editions, was that it was prepared by a clinician who recognized the needs and interests of the practitioner more fully than did the authors of books who are engaged solely in the laboratory in the study of diseased tissues and function. This quality is well maintained in the present edition and will make it popular with medical men in general, and particularly with those teachers of medicine and pathology who recognize that it is important in teaching all departments of medicine to increase the interest of the student by letting him see the practical bearing of the text to which he is devoting himself.

Practical Materia Medica and Prescription Writing. Illustrated. By Oscar W. Bethea, M.D., Ph.G., F.C.S. The F. A. Davis Company, Philadelphia, 1915. Price $4.00.

The writer of this volume states that in the treatment of disease the physician is usually confronted with the following problems: What is the true condition of the patient? What changes should be produced in that condition? What agents will best effect these changes? What form and by what method should these agents be employed to obtain the best results? How should his orders for these agents be written so as to serve the best interests of the patient and his associates? Dr. Bethea

thinks that the first three of these requisites are exhaustively treated in many excellent volumes and ably taught in the medical schools, whereas he believes that the last two propositions are often neglected. With this idea in view he has prepared the text of his volume, which covers about 550 pages. The closing pages contain typical prescriptions obtained in practice with criticisms as to their form, pharmacy, and therapeutics. The rest of the volume is devoted to a statement of the drugs which are official and also of the preparations which are made from them, and many typical illustrations are given as to how they may be prescribed. Comparatively little space, however, is devoted to the physiological action and therapeutic effect of drugs, only a few lines being given in each instance. It would appear, therefore, that this book is not capable of being substituted for the regular text-books of therapeutics, but is to be used as a companion volume, and as such it will prove very useful to young practitioners and to those older ones who still feel that they need instruction as to how to make their prescriptions most efficacious and useful.

A Synopsis of Medical Treatment. By George C. Shattuck, M.D. Second Edition, Revised and Enlarged. W. M. Leonard, Boston, 1915. Price $1.25.

As we pointed out when noticing the first edition of this little book, it is designed to be a handbook for the student and possibly for the young practitioner. The text is arranged according to diseases with the treatment that should be instituted. Every alternate page is blank, and, although the total number of pages is 185, there are therefore only one-half this number of pages of text. For this reason brevity has forced the author into making very dogmatic statements in regard to treatment, and, as is the case whenever dogmatic statements are made, an erroneous impression will often be gained by the inexperienced. Thus the bald statement that "irritating diuretics, such as calomel, are dangerous in all forms of nephritis" is certainly at variance with the opinion of a great many competent practitioners. Similar instances might be named.

We have no doubt that this little volume will prove of great value to the students who follow Dr. Shattuck's postgraduate clinical teaching, but we do not think that it can be placed in the hands of every one without evil results, since, when used by his student, his personal teaching can modify the statements in print so that the inexperienced can gain a true perspective as to the relative value of remedies.

Progressive Medicine. A Quarterly Digest of Advances, Discoveries, and Improvements in Medical and Surgical Sciences. Edited by H. A. Hare, M.D., Assisted by L. F. Appleman, M.D. Lea & Febiger, September 1, 1915.

The present issue of Progressive Medicine contains a little over 300 pages and deals, as in previous September issues, with the subjects Diseases of the Thorax and its Viscera, Including the Heart, Lungs, and Blood-vessels, by Dr. William Ewart, of London; Dermatology and Syphilis, by Dr. William S. Gottheil, of New York; Obstetrics, by Dr. Edward P. Davis, of Philadelphia; and Diseases of the Nervous System, by Dr. William G. Spiller, of the same city.

As has been pointed out repeatedly, the object of this publication is to provide the reader with a competent summarization of medical literature in each department during the past twelve months, with personal remarks and criticisms added on the part of the collaborator who prepares the article. The collaborators in the present volume have had charge of these departments for a number of years, are thoroughly familiar with the needs of physicians, and are recognized everywhere as authorities in their various departments.

The Starvation Treatment of Diabetes. By Lewis Webb Hill, M.D. With an Introduction by Richard C. Cabot, M.D. W. M. Leonard, Boston, 1915. Price $1.00.

The present booklet represents in a concise form the method as carried out by Dr. Allen at the Rockefeller Hospital, and by the staff of the Massachusetts General Hospital.

In addition to very briefly describing the plan of treatment, the various tests which are employed in the examination of the

urine are given, and the rest of the book is taken up with tables or diet lists that are employed in carrying out Dr. Allen's method. There can be no doubt that in certain cases at least it will produce good results. The important thing, however, for the practitioner to bear in mind is that starvation of a diabetic should not be practiced until the physician has studied the case long enough to have definite and clear conceptions as to not only the quantity of sugar which is passed, but more important the tendency to, and degree of, so-called acidosis which exists in an individual patient.

THE PRINCIPLES OF HUMAN PHYSIOLOGY. By Ernest H. Starling, M.D., F.R.C.P., F.R.S. Second Edition. Copiously Illustrated. Lea & Febiger, Philadelphia, 1915.

The great popularity of the first edition of Professor Starling's book upon "Physiology" speedily exhausted it, and now the second edition has appeared. The sections dealing with Voluntary Muscle and the Circulation have been rewritten and new sections added dealing with the "Nutrition of the Brain" and with the "Innervation of the Bronchi."

Professor Starling is so well known as a physiologist the world over, and his investigations and summarizations concerning physiological subjects have been read with so much interest by men engaged in the practice of medicine, that it is hardly needful for us to point out that this last contribution from his pen is one of the standard works on the subject of which it treats. Careful attention is given to the important topic of Internal Secretions. A copious index completes the volume.

A TEXT-BOOK OF CHEMISTRY AND CHEMICAL URANALYSIS FOR NURSES. By Harold L. Amoss, S.B., S.M., M.D. Lea & Febiger, Philadelphia, 1915.

Dr. Amoss believes that the demands for a simple book on chemistry, written especially for and adapted to the needs of the nurse, has become more and more urgent with the institution of a regular course on chemistry in the best training schools. He also believes that the more chemistry a nurse knows, in usable form, the greater her value to the patient and to the physician, and says that if the nurse knows no chemistry how can she be expected always to remember that starches yield sugar and are to be given to the diabetic with extreme caution? And, what can the term calorie mean to her? The question is, does she need to know such facts? Altogether Dr. Amoss has 41 chapters in his book, and as the volume is a small one and contains less than 300 pages these various chapters are necessarily brief.

MOTHERCRAFT. By Sarah Comstock. Hirst International Library Company, New York. Price $1.00.

There are eight chapters in this volume, containing the following titles: Motherhood To-morrow; The Days Before the Stork; Hygiene in the Baby's Wardrobe; Feathering the Nursery Nest; Feeding the New Baby; The Growing Body of Your Child; A Footing for Life; The Growing Mind of Your Growing Child. These titles give some idea of its scope. It also contains a number of illustrations. The material of which the book is composed first appeared in the *Good Housekeeping Magazine*.

WAR SURGERY. By Edmond Delorme. Translated by H. De Meric. Illustrated. Paul B. Hoeber, New York, 1915.

This excellent book, written by the Inspector-General of the French Army and translated by Meric, is designed both for beginners and also for those surgeons whose very large practice has not allowed them to follow the advances in military surgery.

Tincture of iodine is regarded as the safest and best disinfectant, both on the fighting line and in the rear. There are many references to the Manchurian campaign and the Boer war, but comparatively few to the fighting in Belgium and France and Russia. As to emphysematous gangrene, which, as the distinguished author states, "has been already seen in many forms, chiefly on German wounded who have been abandoned," peroxide of hydrogen both as a wash and as an intercellular injection is advised.

There is at the present writing no evi-

dence of any large advance in military surgery save that incident to the prophylaxis of tetanus. That something ultimately will come out of this war cannot be doubted.

THE TREATMENT OF GONORRHEA AND ITS COMPLICATIONS IN MEN AND WOMEN. By William J. Robinson, M.D. Critic and Guide Company, New York, 1915.

Under this winning title the author embodies much of the current knowledge and practice under the diagnosis and treatment of gonococcal urethral infections. He has put in easy-running narrative the result of an evidently large experience, making it available for the general practitioner. The book is characterized by sound common sense and by an evident desire to state accurately and fairly the value of various procedures, to caution against common mistakes in the treatment of this infection, and point out the route by which cure may be most efficiently and permanently insured.

THE CLINICS OF JOHN B. MURPHY, M.D., JUNE, 1915. W. B. Saunders Company, Philadelphia and London.

This particular volume of an always welcome series begins with one of Murphy's brilliant talks on the Diagnosis of Injuries to the Carpus. Thereafter Appendicitis is taken up, and Intestinal Obstruction. There is included one of Mayo's illuminating discussions on the Analyses of the Causes of Unsuccessful Gastroenterostomy and Suggestions for Better Technic. Murphy's method of suturing a pedicled muscle flap into a laminectomy defect is excellently illustrated. Thereafter follow discussions of cases of varying nature.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

This month, which is usually harvest month, has been characterized by unpropitious weather. We have had alternations of rain and sunshine and sometimes thunder-storms, which have much delayed the cutting of corn. In places where the corn has been cut and the rain has got into it a certain amount of mildew is present, but owing to the fact that the first fortnight was rather wet not much has been cut. The corn is not overripe, and as one farmer remarked, "There has been very little harm done yet." The third week has been rather better, and if we have fine weather during the last week of August and the first week of September most of the corn can be gathered in successfully. Possibly this is not altogether detrimental as there is a certain amount of shortage of labor, and if the harvest is spread over five or six weeks instead of half that period, the absence of the usual number of laborers will not be so severely felt. Crops seem to be fairly good and are above the average in quantity.

There does not seem to be any actual medical news to report this month. As there have not been any big actions there has not been a large influx of wounded. Preparations for the accommodation of larger numbers are being pushed forward, new hospitals are being constructed, and preëxisting buildings are being commandeered and converted into hospitals. Amongst those still remaining in hospital are a few victims of frost-bite or trench disease, who were admitted in the winter or early spring. The majority of those attacked with this condition have recovered completely and rejoined their units. The remaining cases are chiefly individuals in whom areas of tenderness have not yet resolved. Such areas are generally to be found in the soles of the feet about such points as the balls of the toes. These patients complain of tenderness in this area when the foot is placed on the ground, and on examination pressure between the heads of the first and second or second and third metatarsal bones gives rise to pain. In this area there also appears to be a diminished quantity of subcutaneous fat. As time goes

on the tenderness appears to diminish, but the progress is slow. In other respects these patients seem to be perfectly well. Others develop a form of erythromelalgia, so that when they hang their feet down they become cold, swell, and certain areas in the skin become red or blue. These areas are not at all tender or anesthetic, but are quite constant in distribution. These soldiers are obviously quite unfit to be returned to the firing line at present. Usually the cases of trench disease are sent out of hospital in the course of six weeks or two months. Another type of case which does not resolve is that of the patient with nephritis who is passing large quantities of albumin with casts and sometimes blood, and from which urine a certain number of diplococci can be cultivated. These patients have no symptoms, feel quite well in themselves, but no treatment which has at present been tried seems to make any appreciable reduction in the quantity of albumin. There are also a certain number of cases of so-called rheumatism coming in, but I think these pains are to be ascribed to general asthenia rather than to anything in the form of true rheumatic fever. With complete rest these patients get well fairly rapidly.

The question of holidays this year has given rise to much discussion; the general opinion seems to be that men will not get much holiday, if any, and that depending upon the amount of work they have the opportunity of doing. On the other hand, the women and children are, as far as possible, getting the usual holiday. The east coast is not as favored as such places as Harrogate and Buxton, which are quite full, people having considerable difficulty in booking accommodation in these resorts. In spite, however, of the drawbacks to the east coast the holiday places are fairly full, though nothing like so full as in ordinary times, a large number of people having gone to the south coast instead.

You have no doubt received news of a considerable number of Zeppelin raids, which have apparently actually taken place. Although these raids are not fully reported in the newspapers, one can learn something about them from the communication of people who have been in the neighborhoods attacked. Whether intentionally or not, these raids have not caused a great deal of damage, and little damage has been done in places of military importance. It is certainly quite true to say that people are not scared by them, and the Zeppelins are a matter of interest rather than of fear. When the Zeppelins are reported the special constables are called on duty, the fire-engines are put in immediate readiness, and the people go out into their gardens or else into the streets to look at them. A number of the bombs fall into the streets, and in some cases the violence of the explosion has shattered the windows of the surrounding houses and the flying glass has caused some injuries. When a house is fairly struck great damage ensues. When the bombs fall into empty spaces they form big craters, which are a source of great joy to the younger members of the population, and in the course of a few hours the sides of the crater become perfectly smooth and polished. This is due to the fact that the children sit on the edge and slide down to the bottom. and in fact perfectly enjoy the fun on these artificial slides. A large number of bombs have been dropped in fields and have caused no damage. In some cases this is probably due to the fact that the Zeppelin being alarmed had to get rid of considerable weight in order to rise rapidly. This in any case seems to be an explanation of their dropping as many as twelve to twenty bombs in a small field of some seven to ten acres.

The death of Professor Paul Ehrlich will be received throughout the world with great regret, and nowhere among scientists more than in this country. He has frequently been over to London to deliver addresses and lectures, and has been received and fêted by many of our scientific clubs. His untimely death at the present time is the more to be regretted as it prevents those in this country and in the allied countries from showing their respect to one who has undoubtedly done as much or more than any living man for medical science.